L 21159-65
ACCESSION NR: AT5002851

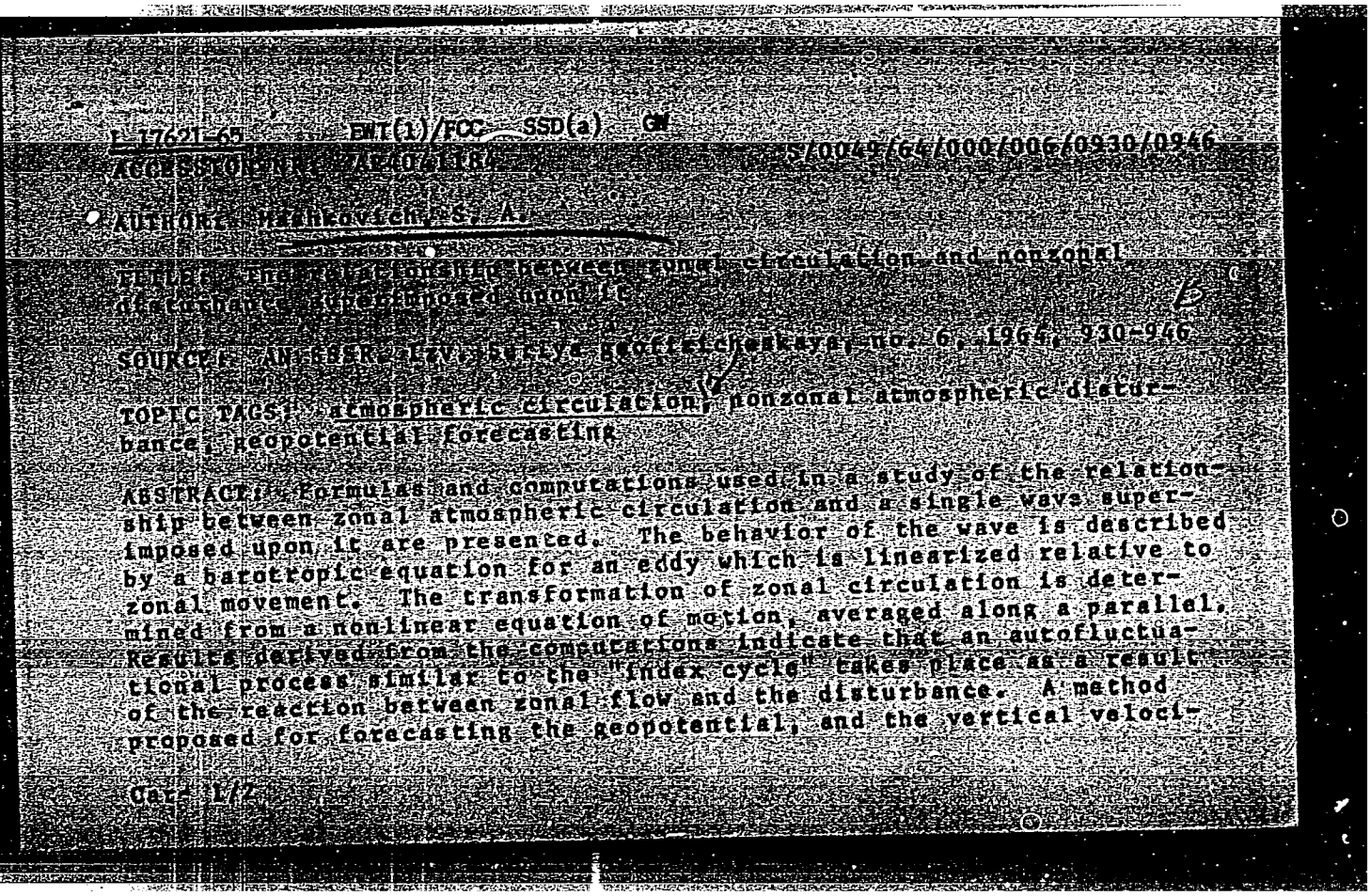
analyzed at the same time. The analysis was made for a map in a stereographic projection but the program is easily adaptable and by means of very small modifications can be used for any regular grid and maps in any projection. Auxiliary standard tables, prepared in advance, are used in the solution of the problem. The algorithm, described in detail, is divided into 8 steps; the standard tables introduced into the computer and standard tables formed in the machine are described fully. Particular attention is given to the "station search" process. Eight stations closest to the point to be analyzed are selected and assigned relative weights; the weighting method is discussed. The described algorithm makes it possible to solve effectively the problems involved in objective analysis of hemisphere pressure pattern charts, particularly due to the effectiveness of the station search procedure. The entire method is to be improved further. Greater attention will be given to allowance for climatic values in the analysis. Orig. art. has: 7 formulas and 2 figures.

ASSOCIATION: Mirovoy meteorologicheskiy tsentr (World meteorological center)

SUBMITTED: 00 ENCL: 00 SUB CODE: DP, ES

NO REF SOV: 003 OTHER: 000

Card 2/2



L 17621-65 EWT(1)/FCC SSD(a) GW

ACCESSION NR: AP4041184 S/0049/64/000/006/0930/0946

AUTHOR: Vlasikovich, S. A.

TITLE: The interaction between zonal circulation and nonzonal disturbance superimposed upon it

SOURCE: AN SSSR. Izvestiya. Geofizicheskaya seriya, no. 6, 1964, 930-946

TOPIC TAGS: atmospheric circulation, nonzonal atmospheric disturbance, geopotential forecasting

ABSTRACT: Formulas and computations used in a study of the relationship between zonal atmospheric circulation and a single wave superimposed upon it are presented. The behavior of the wave is described by a barotropic equation for an eddy which is linearized relative to zonal movement. The transformation of zonal circulation is determined from a nonlinear equation of motion, averaged along a parallel. Results derived from the computations indicate that an autofluctuational process similar to the "index cycle" takes place as a result of the reaction between zonal flow and the disturbance. A method proposed for forecasting the geopotential, and the vertical veloci-

Card 1/2

L 17621-65
ACCESSION NR: AP4041184

tics in a baroclinic atmosphere, takes the reaction between zonal movement and non zonal baric formations into account, as well as the effects of surface drag and thermal transformations in the air. Orig. art. has: 6 tables and 45 formulas.

ASSOCIATION: Vy*chislitel'nyy meteorologicheskiy tsentr, GUGMS (Meteorological Computer Center GUGMS)

SUBMITTED: 09Jul63 ENCL: 00 SUB CODE: ES

NO REF SOV: 020 OTHER: 009

Card 2/2

MASHKOVICH, S.A.

Increasing the quality of the objective analysis of the baric field over regions with a sparse network of aerological stations. Trudy MMTS no.10:31-39 '65. (MIRA 19:1)

MASHKOVICH, S.A.; GUBANOVA, S.I.

Experience in using the methodoloby of the objective analysis of constant-pressure charts of the northern hemisphere. Trudy MMTS no.10:40-52 '65. (MIRA 19:1)

L 8808-66 EWT(l)/EWT(m)/ETC/T/EWP(b)/EWA(c)/ETC(m)/EWP(t)/EWG(m) IJP(c)

ACC NR: AP5024707 JW/GG/JD SOURCE CODE: UR/0056/65/0049/003/0857/0861

44,55

AUTHOR: [illegible]

ORG: Novosibirsk State University (Novosibirskiy gosudarstvennyy universitet)

TITLE: Contribution to the thermodynamics of a simple cubic Ising lattice

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 49, no. 3, 1965, 857-861

TOPIC TAGS: Ising lattice, statistic distribution, thermodynamic function

ABSTRACT: It is shown that the logarithm of the partition function for a simple cubic lattice cannot be represented in a form such that when one of the coordinates vanishes the partition function goes over into the corresponding Onsager formula for the two-dimensional Ising lattice. In contrast to the work of other authors, the series for the partition function are therefore calculated for the case of an anisotropic lattice, both in the high temperature and in the low temperature approximations. Both the high and the low temperature approximations are based on a simple generalization of methods used in various papers by many authors. Author thanks Yu. B. Rumer who has brought this problem to his attention and V. L. Pokrovskiy for a discussion of the results. Orig. art. has: 1 figure and 9 formulas.

SUB CODE: 20/ SUBM DATE: 16Mar65/ ORIG REF: 005/ OTH REF: 014

Card 1/1

L 43066-66 EWT(1) GW

ACC NR: AT6014299 (N) SOURCE CODE: UR/3118/65/000/010/0031/0039

AUTHOR: Mashkovich, S. A.

48
B+1

ORG: none

TITLE: Improvement of the quality of objective analysis of the baric field over regions with a sparse network of aerologic stations

SOURCE: Mirovoy meteorologicheskiy tsentr. Trudy, no. 10, 1965. Ob"yektivnyy analiz i obrabotka meteorologicheskikh dannykh (Objective analysis and processing of meteorological data), 31-39

TOPIC TAGS: weather forecasting, atmospheric geopotential, mathematical analysis, weather map, weather station, meteorologic satellite

ABSTRACT: The advantages of employment of additional information in the system of objective analysis (based on the method of optimal interpolation) developed by L. S. Gandin (Ob'yektivnyy analiz meteorologicheskikh poley. Gidrometeoizdat, L., 1963) are reviewed. The additional information, which may derive from prognosis of the baric field based on data from the preceding period, baric field as delineated from observation of weather satellites, geopotential values calculated from ground observations, and other sources must be corrected by introducing the so-called "optimal congruence" factor. Derivation of the formula for that factor is given. Figure 1 represents values for $\delta E = \overline{\sqrt{E}} - \sqrt{E}$.

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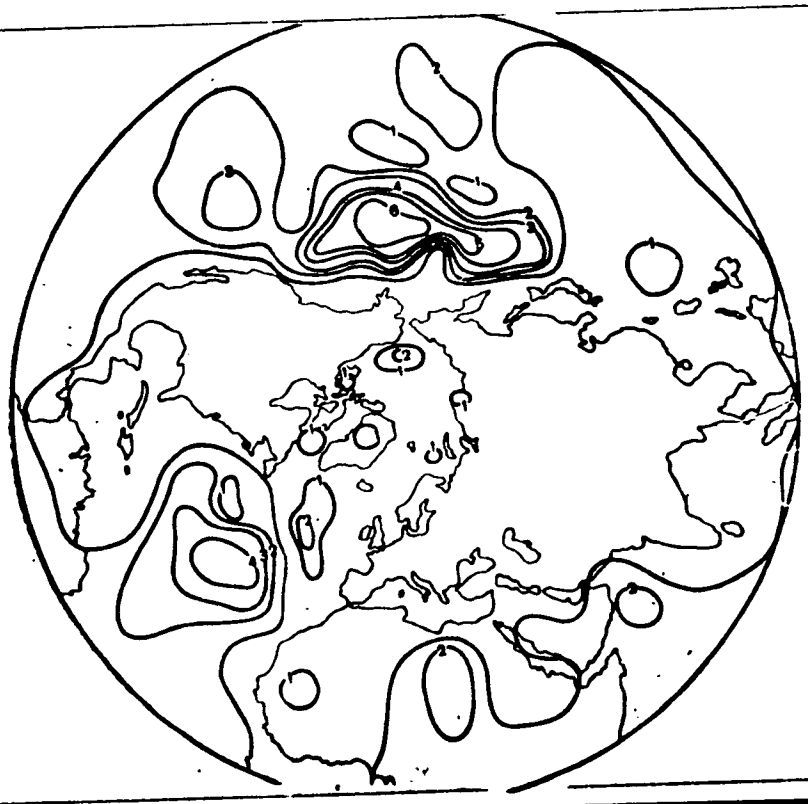
L 43066-66
ACC NR: AT6014299

Fig. 1. Geographic distribution of the value $\sqrt{\overline{E}} - \sqrt{E}$.



Card 2/3

ACC NR: AT6014299

where E = mean square of error in representing the geopotential field when interpolation of aerological observations and coordination (congruence) of additional information are performed simultaneously; E = the same value, not including optimal congruence factor. The decrease in error of theoretical analysis is most pronounced over certain areas of the Pacific and Atlantic oceans, where it may be reduced by 4-6 decimeters. Inclusion of the factor with additional data also permits reduction of aerological stations required for objective analysis. Orig. art. has: 2 tables, 3 figures, and 16 equations.

SUB CODE: 04/ SUBM DATE: none/ ORIG REF: 012/ OTH REF: 002

Card 3/3 hs

L 38322-66 EWT(1)/FCC GW

ACC NR: AT6014300 (N) SOURCE CODE: UR/3118/65/000/010/0040/0052

AUTHORS: Mashkovich, S. A.; Gubanova, S. I. 32 B+1

ORG: none

TITLE: An experiment in application of the objective analysis method to baric topography maps of the northern hemisphere

SOURCE: Mirovoy meteorologicheskiy tsentr. Trudy, no. 10, 1965. Ob"yektivnyy analiz i obrabotka meteorologicheskikh dannykh (Objective analysis and processing of meteorological data), 40-52

TOPIC TAGS: synoptic meteorology, computer application, electronic computer

ABSTRACT: Several aspects of the application of objective analysis of ground surface pressure AT_{700} and AT_{500} are discussed for the purpose of coding the information for computers. The following points were emphasized: 1 - determination and elimination of the errors in original information; 2 - calculation of the values for meteoelement at the junction points of the network from observed data; 3 - printing of the results of calculations or illustration in graphical form. The general method of the analysis follows the scheme discussed earlier by S. A. Mashkovich (Ob ob'yektovnom analize kart baricheskoy topografii severnogo polushariya. Trudy MMTs, vyp. 4, 1964). Horizontal control, i.e., checking the validity of the information

Card 1/3

ACC .NR: AT6014300

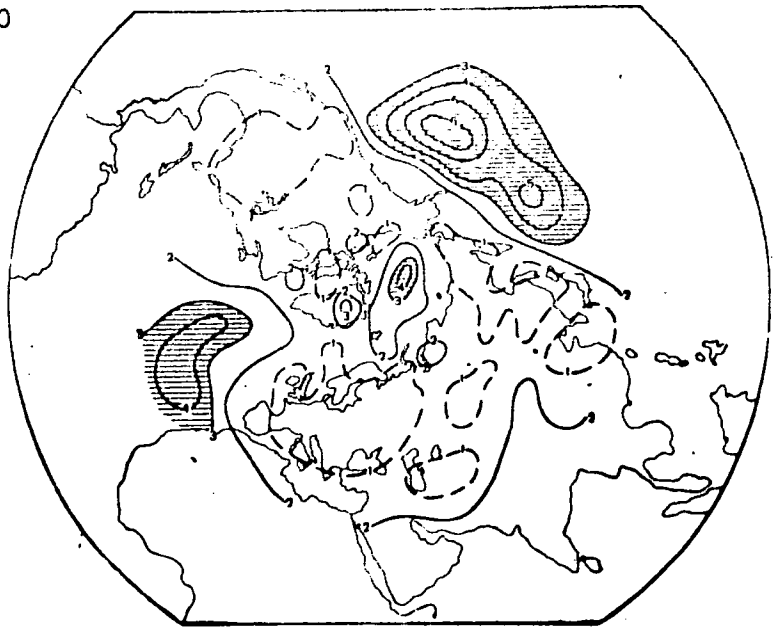


Fig. 1. Average divergence (dkm) between the objective and synoptic analyses of AT_{500} maps.

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ACC NR: AT6014300

by matching the observed data at various points of the fixed level, was introduced in addition to the vertical control used earlier. The new method exposes errors of ~ 5 dkm and up. The values of the geopotential were calculated for a given observatory from data obtained from neighboring stations. Maps drawn by means of objective analysis were compared with those analyzed by synoptic method. In general, the results of the latter method coincided with the calculated data. The divergence between the two methods is illustrated in Fig. 1. Orig. art. has: 6 tables and 2 figures.

SUB CODE: 04, 09/ SUBM DATE: none/ ORIG REF: 012/ OTH REF: 002

Card 3/3

67197

SOV/58-59-7-15748

24.7700

Translation from: Referativnyy Zhurnal Fizika, 1959, Nr 7, p 156 (USSR)

AUTHOR: Valeyev, Kh.S., Mashkovich, V.D.

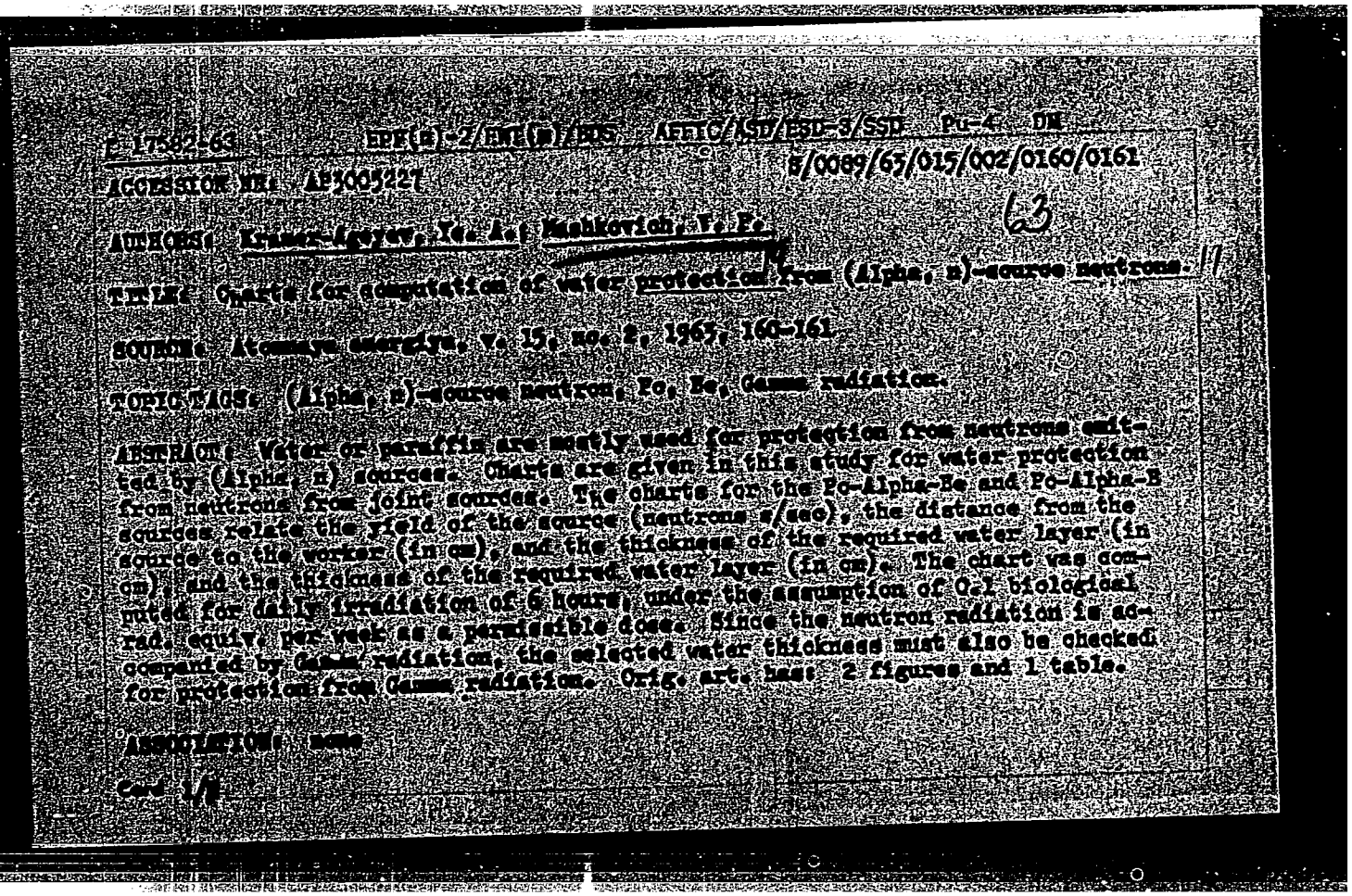
TITLE: Nonlinear Ceramic ZnO - TiO_2-Base Semiconductors

PERIODICAL: V sb.: Primeneniye poluprovodnikov v elektrotekhn. Leningrad, 1958, pp 115 - 123

ABSTRACT: A new type of nonlinear resistor has been developed from ZnO with admixtures of TiO_2. It was established that the nonlinearity of the resulting ceramic semiconductors is due to electron-hole transitions on the grain-boundaries of ZnO and the spinel of $2ZnO - TiO_2$. Cheap raw materials were used for the preparation of these semiconductors. The presence of semiconductor properties in conjunction with nonlinearity at various concentrations of TiO_2 (10 to 25%) makes it possible to produce semiconductors with a ρ ranging from about 10^2 to 10^6 ohms · cm (at 6 V). It is possible to prepare high-resistance, as well as low-resistance, nonlinear elements, capable of functioning at increased temperatures and of dissipating high power. (Gos. issledovatel'skiy elektrokeramich. in-t, USSR).

Card 1/1

The authors' résumé



P-17582-63 EPF(n)-2/EWT(m)/EPS AFTTC/ASD/ESD-3/SSD Pu-4 DM
ACCESSION NR: AP3005221 S/0089/63/015/002/0160/0161
AUTHORS: Kramer-Agyew, Ye. A.; Mashkovich, V. P.
TITLE: Charts for computation of water protection from (Alpha, n)-source neutrons.
SOURCE: Atomnaya energiya, v. 15, no. 2, 1963, 160-161
TOPIC TAGS: (Alpha, n)-source neutron; Po, Be, Gamma radiation.
ABSTRACT: Water or paraffin are mostly used for protection from neutrons emitted by (Alpha, n) sources. Charts are given in this study for water protection from neutrons from joint sources. The charts for the Po-Alpha-Be and Po-Alpha-B sources relate the yield of the source (neutrons n/sec), the distance from the source to the worker (in cm), and the thickness of the required water layer (in cm) and the thickness of the required water layer (in cm). The chart was computed for daily irradiation of 6 hours, under the assumption of 0.1 biological rad. equiv. per week as a permissible dose. Since the neutron radiation is accompanied by Gamma radiation, the selected water thickness must also be checked for protection from Gamma radiation. Orig. art. has: 2 figures and 1 table.
ASSOCIATION: None
Card 1/1

MASHKOVICH, V.P.

89-10-20/36

AUTHORS Gusev N.G., Osanov D.P., Mashkovich V.P.,

TITLE Measurement of Small α-Emitter Concentrations in Water by Freezing -Out.
(Izmereniye malykh kontsentratsiy α-aktivnykh veshchestv v vode metodom vymorazhivaniya.-Russian)

PERIODICAL Atomnaya Energiya, 1957, Vol 3, Nr 10, pp 346-350 (U.S.S.R.)

ABSTRACT The follwing effect was used for measuring α-contaminations in water:
If α-contaminated water is poured into a receptacle made of insulating material, the bottom of which consists of metal, and if the bottom is frozen -out to -6o°C, the activity in the uppermost layer, i.e. the layers frozen at the end- on the occasion of freezing -out will increase considerably. As a measure for enrichment with the sign K the order of magnitude $K = \frac{N}{N_o}$ is assumed. N is the α-particle number emitted from the surface of the frozen layers, whilst N_o is the number of α-particles which are emitted from the surface of a preparation which is still liquid.
The experimental arrangement, which is described in detail, is now investigated:
1) In what way does the coefficient K depend upon the concentration of the α-active liquid? K does not change in a concentration domain of from 3.10^{-7} C/l to 6.10^{-9} C/l.
2) In what way does K depend upon freezing temperature? For this dependence the relation:

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Measurement Of Small α-Emitter Concentrations in Water by Freezing -Out. 89-10-20/36

$\frac{K}{18} + \frac{T}{100} - 1$ was found.

3) In what way does K depend upon the heigth h? The α-particles are able to emerge and be counted only from a layer h cm strong which is smaller than the α-range in ice and water respectively. For the coefficients of various heights h_1 and h_2 the relation $\frac{K_2}{K_1} = \frac{h_2 + 0,5}{h_1 + 0,5}$ was found.

4) Influence of the chemical composition of the water on the course of freezing.
The coefficient K is attains its highest value in the case in which the α-contaminated water to be frozen is chemically nearly equal to distilled water.

There are 5 figures, 1 table and 2 Slavic references.

SUBMITTED April 24, 1956
AVAILABLE Library of Congress.
Card 2/2

MASHKOVICH, V.P.

21(8) PHASE I BOOK EXPLOITATION SOV/1304

Gusev, Nikolay Grigor'yevich, Vadim Pavlovich Mashkovich, and Gennadiy Vasil'yevich Obvintsev

Gamma-izlucheniye radioaktivnykh izotopov i produktov deleniya; teoriya i tablitsy (Gamma-Radiation of Radioactive Isotopes and Fission Products; Theory and Tables) Moscow, Fizmatgiz, 1958. 208 p. 9,000 copies printed.

Ed.: Margulis, U. Ya.; Tech. Ed.: Akhlamov, S.N.

PURPOSE: This book is for the scientists, engineers, and technicians who use radioactive isotopes and their radiation in various fields.

COVERAGE: The book gives data on the gamma radiation from radioactive isotopes and from mixtures of U^{235} fission products. These data are necessary in practical work, especially in the computation of shielding. Gamma constants are given for about 400 isotopes without initial filters and with lead filters. Other characteristics given are:

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gamma activity per 1 mc in mg-equiv. of radium, intensity of bremsstrahlung, specific β and γ activities, and the spectral composition of γ radiation from U^{235} fission with the consideration of short-lived products in relation to the time of irradiation in the reactor and to the storage time. The first part of the book includes theoretical information on isotopes and radiation. The first two parts were written by N.G. Gusev and V.P. Mashkovich. The tables included in the third part were prepared by G.V. Obvintsev from initial data. L.K. Peker edited the monograph for scientific accuracy (decay schemes).

TABLE OF CONTENTS:

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MASHKOVICH, V.P.

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PHASE I BOOK EXPLOITATION SOV/5717

Moscow. Inzhenerno-fizicheskiy institut.

Pribory i metody analiza izlucheniy; sbornik nauchnykh rabot, vyp. 2. (Apparatus and Methods for the Analysis of Radiation; Collection of Scientific Papers, no. 2) Moscow, Atomizdat, 1960. 166 p. 4000 copies printed.

Sponsoring Agency: Ministerstvo vysshego i srednego spetsial'nogo obrazovaniya RSFSR. Moskovskiy inzhenerno-fizicheskiy institut.

Ed. (Title page): Ye. L. Stolyarova, Candidate of Physics and Mathematics;
Tech. Ed.: S. M. Popova.

PURPOSE: This collection of articles is intended for specialists in nuclear physics, dosimetry of nuclear radiations, and shielding.

COVERAGE: The articles were prepared by scientists of MIFI (Moscow Physics and Engineering Institute) and presented at the 1957 conference of the Institute. Brief annotations to the articles have been included in the Table of Contents. No personalities are mentioned. References follow each article.

Card 1/5

MASHKOVICH, V.P.

Heat emission in shielding from a beam of thermal neutrons considering scattered capture gamma-radiation. Sbor. nauch. rab. MIFI no.2:58-64 '60. (MIRA 14:3)
(Gamma rays) (Shielding(Radiation))

84233

S/089/60/009/004/013/020
B006/B070

26.2241
21.1700

AUTHORS: Dulin, V. A., Kazanskiy, Yu. A., Mashkovich, V. P., Panov, Ye. A., Tsypin, S. G.

TITLE: Investigation of the Attenuation Functions for Water Exposed to Isotropic and Highly Collimated Sources of Fission Neutrons

PERIODICAL: Atomnaya energiya, 1960, Vol. 9, No. 4, pp. 315 - 317

TEXT: In this "Letter to the Editor", the authors report on an experimental investigation of the space distribution of fission neutrons in water, the source of neutrons being a BP-5 (BR-5) reactor. The neutrons came out of a hole in a concrete shield (diameter 250 mm) and fell on a tank (137·139·217 cm) filled with doubly distilled water. The neutron beam had a total angular divergence of ~5°. The neutrons were detected by proportional boron counters. Measurements could be made at each point of the tank, and the position of the point could be determined with an accuracy of 1 mm. Fig. 1 shows the geometry. Figs. 2 and 3 show the measured neutron distributions for different values of r (distance from

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the source) and different values of h (distance from the beam). Fig. 4 shows the attenuation function of neutrons of an isotropic point source multiplied by r^2 (curve a), and the attenuation function of a highly collimated plane source (b). The maximum error of the curve a occurs for small r (r = 40 cm, ~20%), and the minimum error (~5%) occurs for large r. The error of the curve b is between ~5% for r = 40 cm and ~20% for r = 140 cm. The two curves diverge from each other by about 20%, but this is within the limits of the error of measurement. Therefore, for thicknesses of water shield larger than 40 cm, the two curves may be considered to be coincident. Fig. 5 shows, for comparison, the experimentally obtained (Ref. 2) attenuation functions for neutrons of an isotropic disk source (diameter 71.2 cm). The attenuation functions according to which the curves are drawn read:

$$G_{point}(r) = C_1 \int_0^{\pi/2} N(r,\theta)\sin\theta d\theta; \quad G_{plane}(r) = C_2 \int_0^{\infty} N(r,h)h\, dh; \text{ and}$$

84233

Investigation of the Attenuation Functions for Water Exposed to Isotropic and Highly Collimated Sources of Fission Neutrons

S/089/60/009/004/013/020
B006/B070

$D_{disk}(r,a) = 2\pi \int_{r}^{\sqrt{r^2+a^2}} G_{point}(R)H\, dR$. a is the radius of the disk; $N(r,\theta)$ and $N(r,h)$ are the distribution functions shown in Figs. 2 and 3; and the C_i are constants. The authors thank O. I. Leypunskiy and V. V. Orlov for discussions and comments. There are 5 figures and 4 references: 2 Soviet and 2 US.

SUBMITTED: April 27, 1960

X

Card 3/3

84234

S/089/60/009/004/014/020
B006/B070

21.1700
26.2244

AUTHORS: Dulin, V. A., Mashkovich, V. P., Panov, Ye. A., Tsypin, S.G.

TITLE: Energy Distribution of Fast Fission Neutrons in Water

PERIODICAL: Atomnaya energiya, 1960, Vol. 9, No. 4, pp. 318 - 319

TEXT: The authors report on an experimental investigation of the energy distribution in water of fission neutrons from BP-5 (BR-5) reactor. The experimental arrangement is described in Ref. 5. The fast neutrons were detected by threshold indicators which had the form of disks of a diameter of 35 mm and different thicknesses. Data referring to these indicators are given in a table. The disks were oriented at different angles θ with the direction of the incident neutron beam, and placed at different distances h from the beam. Fig. 1 shows the activity of the indicators as a function of θ for r = 30 cm (normalized at $\theta = 9^{0}$). Fig.2 shows the activity of phosphorus indicators as a function of h for r = 30 cm, and r = 60 cm (normalized at h = 0). Fig. 3 shows the energy distribution of neutrons in water at distances of 30 and 60 cm, calculated from the geometry of the experiment for a point source. The neutron

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spectrum is obtained from a solution of the system of equations $N_i(r) = c\varepsilon_i\left[1-\exp(-\lambda_i T)\right].\exp(-\lambda_i t)\int_{E_{t_i}}^{\infty}\Phi(r,E)\sigma_i(E)dE$

$= c\varepsilon_i\left[1-\exp(-\lambda_i T)\right]\exp(-\lambda_i t)\sum_{j=1}^{n}\Phi_j(r,\bar{E})\sigma_{ij}(E)\Delta E_j$ by the method of successive approximations. Here, $N_i(r)$ denotes the activity of the i-th threshold indicator at a distance r from the source after irradiating the indicator for a time T and then waiting for a time t; ε_i is the efficiency of the recording of the activity of the indicator including the correction for absorption and scattering in the sample, air, and counter window; $\sigma_i(E)$ is the reaction cross section at energy E; $\Phi(r,E)$ is the differential neutron flux of energy E at a distance r from the source; c is a constant; i is the index of the indicator (i = 1,2,..n); and j is the index of the

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Energy Distribution of Fast Fission Neutrons in Water

S/089/60/009/004/014/020
B006/B070

energy range. $N_i(r)$ is calculated from the formula $N_i(r)=c_1\int_0^{\pi/2} N_i(r,\theta)\sin\theta d\theta$, where $N_i(r,\theta)$ is the activity of the i-th threshold indicator at a distance r and an angle θ; c_1 is a constant. The relative ε_i values were determined experimentally for each indicator. Fig. 3 gives a comparison of the data obtained with the calculated neutron spectrum (Ref. 1) (normalized at r = 30 cm). The divergences between the two lie between 30 and 50%, which is practically within the limits of error (~30%). The authors thank O. I. Leypunskiy and V. V. Orlov for discussions and comments. There are 3 figures and 6 references: 3 Soviet and 3 US.

SUBMITTED: April 27, 1960

Card 3/3

S/089/61/011/003/008/013
B102/B138

26.2241

AUTHORS: Mashkovich, V. P., Tsypin, S. G.

TITLE: Spatial fast-fission neutron distribution in iron

PERIODICAL: Atomnaya energiya, v. 11, no. 3, 1961, 251-255

TEXT: The spatial neutron distribution has hitherto been insufficiently determined in iron, one of the cheapest and commonest shielding materials. The authors, therefore, made new measurements using the BR-5 (BR-5) reactor. Sets were composed of six iron plates (each 19.5 mm thick), and seven sets were joined to form a prism (1320·1360·1880 mm) Every set had vertical holes (90 mm in diameter, 830 mm deep) for introducing detection probes. While not being used for measurements, the holes were occupied by iron rods. The immersion depth of probes was controlled with an accuracy of 1 mm. Iron Ст.-0 (St.-0) was used (0.6 % impurities: C, Mn, S, P). The threshold indicators: $S^{32}(n,p)P^{32}$, 3 Mev and $Al^{27}(n,\alpha)Na^{24}$, 7 Mev, were used as neutron detectors. The former were 6 mm long, and the latter 20 mm. Both were disk-shaped (35 mm in diameter). The iron prism was irradiated perpendicular to the plate plane by neutrons from a

Card 1/3

Spatial fast-fission neutron ...

250 mm wide reactor channel. The neutron energies ranged between 1 and 8 Mev. The N(E) spectrum displayed an almost linear drop with a rise of E. The activity of the sulfur probes was determined from the decay curves, and that of the aluminum probes from the photoelectron peaks due to the 2.76-Mev gamma radiation from Na^{24}. Correction was made for the activity of the Na^{23} impurity. With this system of plates and probes, the neutron flux attenuation could be determined both in the direction of irradiation and perpendicular to it. Activity was measured on the indicators after 15-20 hr with an end-window counter. Measurements were also made with a fission chamber (Th^{232}, 2 Mev) and an $Mg^{24}(n,p)Na^{24}$ threshold indicator (5 Mev). The following relaxation lengths (in cm) were measured:

Indicator	Thickness range of Fe, cm	Relaxation length in the direction of central beam	Relaxation length for plane unidirectional source
$Th^{232}(n,f)$	50	6.5	7.5
$S^{32}(n,p)P^{32}$	65	5.6	6.5
$Mg^{24}(n,p)Na^{24}$	40	5.6	6.3
$Al^{27}(n,\alpha)Na^{24}$	85	5.8	6.3

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27406

Spatial fast-fission neutron...

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B102/B138

These data are in good agreement with experimental measurements made by other authors, and differ by only about 10 % from the theoretical calculations in Ref. 10. The asymptotic interaction cross sections were calculated in transport-theoretical approximation and were found to range between 1.9 and 2.1 barns. O. I. Leypunskiy, I. I. Bondarenko, V. V. Orlov are thanked for discussions, Yu. K. Yermakov, degree student of MIFI, A. V. Larichev, and A. N. Nikolayev for assistance. There are 6 figures, 2 tables, and 11 references: 7 Soviet and 4 non-Soviet. The three references to English-language publications read as follows: Ref. 3: D. Wood, Nucl. Sci. and Engng., 5, 45 (1959); Ref. 4: E. Blizard. Annual Rev. Nucl. Sci. 5, 91, (1955); Ref. 10: H. Goldstein The attenuation of Gamma Rays and Neutrons in Reactor Shields, US AEC Washington, 1957.

SUBMITTED: January 30, 1961

Card 3/3

MASHKOVICH, V. P.

[redacted]

INTERNATIONAL ATOMIC ENERGY AGENCY, (IAEA)
Symposium on Neutron Detection, Dosimetry and Standardization - Harwell, England, 10-14 December 1962

DOROSHENKO, G. G., GLAGOLEV, V. I., BARABANOV, I. R., and FILEDYUSHKIN, I. V. - "A new method for studying continuous fast neutron spectra - the counting efficacies method" (Section I.1.(4))

DOROSHENKO, G. G., and Ye. L. STOLYAROVA [STOLYAROVA in 1960 was a member of the Moscow Engineering Physics Institute] - "A new method for separating pulses from fast neutrons and Y quanta" (Section III)

IVANOV, V. I. - "A modified procedure for using the Hurst type proportional counter for dosimetry of mixed Y-neutron radiation" (Section III)

MASHKOVICH, Vadim Pavlovich - "The spectrometric method and the attenuation-curve analysis method for determining the activity of threshold indicators" (Section I.3.(2))

STOLYAROVAYA, Ye. L. [In 1960 was a member of the Moscow Engineering Physics Institute] - "Methods of fast-neutron spectrometry and the opportunities for their use in neutron dosimetry" (Section II.4)

ZIELEZYNSKI, M. [ZIELEZYNSKI is listed in the program as a USSR author; he may, however, be Mieczyslaw ZIELINSKI who in 1958 was at Warsaw University, Poland] - "Recombination method of linear energy transfer (LET) determination of mixed adiation" (Section V)

ZOLOTUKHIN, V. G., DOROSHENKO, G. G., and YEFIMENKO, B. A. - "Calclation of pulse-height distributions and counting efficiencies of a fast-neutron scintillation detector" (Section I.2).

(5)

24 6400

S/892/62/000/001/001/022
B102/B186

AUTHORS: Gusev, N. G., Mashkovich, V. P., Verbitskiy, B. V.

TITLE: Improvement of the gamma constants of radio-isotopes

SOURCE: Moscow. Inshenerno-fizicheskiy institut. Voprosy dozimetrii i zashchity ot izlucheniy, no. 1, 1962, 7-23

TEXT: The total gamma constants K_γ, giving the dose rate in r/hr of a point gamma source of 1 mc activity at a distance of 1 cm without filtration, are calculated using a formula of Dzhelepov-Peker (Skhemy raspada radioaktivnykh yader - Decay charts of radioactive nuclei - M.-L., Izd-vo AN SSSR, 1958). The results are given in a table covering 10 pages. Most of the data tabulated are taken from the above publication and from Strominger-Hollander-Seaborg (Rev.Mod.Phys. 30, no.2, part II, 1958), the remainder from one of the 202 references given. There are 2 tables.

Card 1/1

4544
S/892/62/000/001/002/022
B102/B186

21.2400

AUTHOR: Mashkovich, V. P.

TITLE: Application of monodirectional point and disc sources for investigating the shielding properties of materials

SOURCE: Moscow. Inshenerno-fizicheskiy institut. Voprosy dozimetrii i zashchity ot izlucheniy, no. 1, 1962, 24-32

TEXT: The author derives certain transformations which can be used for the transition from the spatial radiation distribution of a reference source (in most cases a monodirectional point source) to any other types of sources. The spatial radiation distribution is characterized by attenuation functions H(R) or G(R) describing the variation of flux, intensity or dose rate with respect to the distance R from the source. Transformation relations are given for the transitions from a monodirectional point source to an isotropic point source, an anisotropic point source, and to a monodirectional infinite plane source. The fundamental relation $G_{pl.mono}(r) = \int_s H(r,h)ds = C \int_0^\infty H(r,h)hdh$ obtained for

Card 1/3

Application of monodirectional point ...

the latter case (cf. Fig.2b) can be correspondingly modified for transitions from a monodirectional point source to sources of any size, shape, and angular distribution of radiation; $N(r,h)$ is the contribution of radiation from the areal element ds to the detection reading. It is shown that this relation also describes the transition from a monodirectional disc source to an infinite monodirectional source with an accuracy up to a constant factor. One obtains

$$G_{pl.mono}(r) = \frac{C_1}{\pi a^2} \int_0^\infty N_{disc,mono}(r,h)hdh.$$

The transition from the attenuation function of a monodirectional disc source to that of a monodirectional point source is possible if certain assumptions as to the spatial distribution of radiation in a plane perpendicular to the beam are made. Calculations were made for a monodirectional disc source (d=30 cm) of thermal and intermediate fission neutrons in water, and the spatial distribution was measured. The neutron distribution of the point source is assumed as $N(r,h)=F(r)\exp(-h/L(r))\alpha(h)$; $\alpha(h)$ is a correction factor, $L(r)$ the relaxation length of the exponential parts of the $N(h)$ curves. The most important English-language reference is: W. Stinson, Nucleonics, 12,50,1954. There are 6 figures.

Card 2/3

Application of monodirectional point ...

S/892/62/000/001/002/022
B102/B186

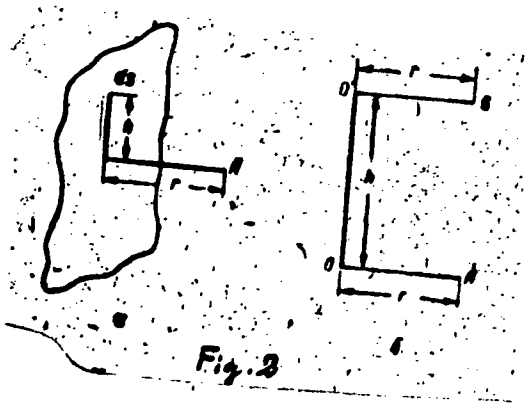


Fig. 2

Card 3/3

45446

S/892/62/000/001/008/022
B102/B186

26.2240

AUTHORS: Kramer-Ageyev, Ye. A., Mashkovich, V. P.

TITLE: Dose distribution of fission neutrons in certain protective materials

SOURCE: Moscow. Inshenerno-fizicheskiy institut. Voprosy dozimetrii i zashchity ot izlucheniy, no. 1, 1962, 57-65

TEXT: The neutron dose distribution characteristics were determined for a series of materials, under the assumption that the following four groups contribute to the dose: (1) thermal neutrons with $E > 1$ ev; (2) slow neutrons with 1 ev $< E <$ 100 ev; (3) intermediate neutrons with 100 ev $< E <$ 0.5 Mev and (4) fast neutrons with $E > 0.5$ Mev. The doses are determined from flux measurements: $D(r) = \int_{E_i}^{E_{i+1}} \phi(r,E) \cdot \eta(E) dE$ with $\phi(r) = \int_{E_i}^{E_{i+1}} \phi(r,E) dE$ - ($\phi(r,E)$ being the flux). For water the dose spectral distribution was determined from experimental data taken from US

Card 1/2

Dose distribution of fission ... S/892/62/000/001/008/022
B102/B186

publications (Aronson, US AEC, Rep.NYO-6267,1954; Beckurts, Nucl.Instrum. and meth.,11,no.1,144,1961; Aronson et al. US AEC,Rep.NYO-6269,1954). An analysis of the curves obtained shows that the fast neutrons contribute most to the dose - e.g. at r=90 cm the dose due to the fast flux is ten times as great as the dose due to the intermediate flux, and 100 times that of the slow neutrons. The dose spectra obtained similarly for carbon show that for thicknesses > 50-60 g/cm^2 virtually the whole dose is due to thermal neutrons; in less thick shields fast neutrons also make a significant contribution. The dose spectra for concrete show that concrete behaves more like water than like carbon. The low-energy groups, however, differ less from the fast component than in water. The main groups are, therefore: for water - the fast, for carbon - the thermal, for concrete - the fast, intermediate and thermal, and for iron - the intermediate group (D. Wood, Nucl.Sci.Engng.,5,45,1959). There are 7 figures and 1 table.

Card 2/2

45452

S/892/62/000/001/015/022
B102/B186

21.6000

AUTHOR: Mashkovich, V. P.

TITLE: Methods of determining the induced activity of threshold indicators

SOURCE: Moscow. Inshenerno-fizicheskiy institut. Voprosy dosimetrii i zashchity ot izlucheniy, no. 1, 1962, 100-107

TEXT: If threshold indicators are used for fast-neutron detection, the indicator activity has to be determined for obtaining the neutron fluxes or spectra. The induced activity is usually determined from the decay curves, which is possible if the half-lives of accompanying and fundamental activities are different. This is, however, not the case if the isotopes responsible for both types of activities are identical or have similar half-lives, e.g. if the fast flux has a thermal and intermediate background. The thermal neutrons are easily filtered out but the problem remains to determine the fast flux on the intermediate background. In the case of different isotopes the activity of the fundamental one can be determined spectrometrically; in the case of identical isotopes

Card 1/3

Methods of determining the induced ...

the neutrons of both groups have to be separated. Usually the fundamental activity is due to fast neutrons and the accompanying activity to intermediate ones. The neutrons can be identified according to their attenuation in protective material, since the fast group alternates more rapidly. The method of subtracting the fast component and determining the fast flux is demonstrated using the example of the fast neutron distribution in iron when $Al^{27}(n,\alpha)Na^{24}$ is taken as indicator reaction. The neutrons came from a monodirectional disc source. The measurements were made in the direction of the neutron beam and perpendicular to it. The accompanying activity of Cu^{64} (12.8 hrs) produced in $Cu^{63}(n,\gamma)Cu^{64}$ reactions of the copper impurity could not be separated from the 15-hr activity of Na^{24} in the decay curves, so the accompanying γ-activity was measured with a spectrometer. The Co^{60} γ-radiation was taken as reference standard. The Na^{24} γ-activity was determined from the area of the 2.76-Mev peak. Intermediate neutrons, however, induce the reaction $Na^{23}(n,\gamma)Na^{24}$, which leads to the same isotope as the (n,α)-reaction of

Card 2/3

Methods of determining the induced ... S/032/62/000/001/015/022
B102/B138

the fast neutrons. The attenuation curve flux-versus-distance consists in this case of two linear sections joined by a curved one; the linear section for short distances corresponds to the fast neutrons, that for large distances (r>90 cm) to intermediate neutrons. Both linear sections linearly extrapolated describe the behavior of the fast and intermediate group alone. There are 3 figures.

Card 3/3

S/196/62/000/003/007/019

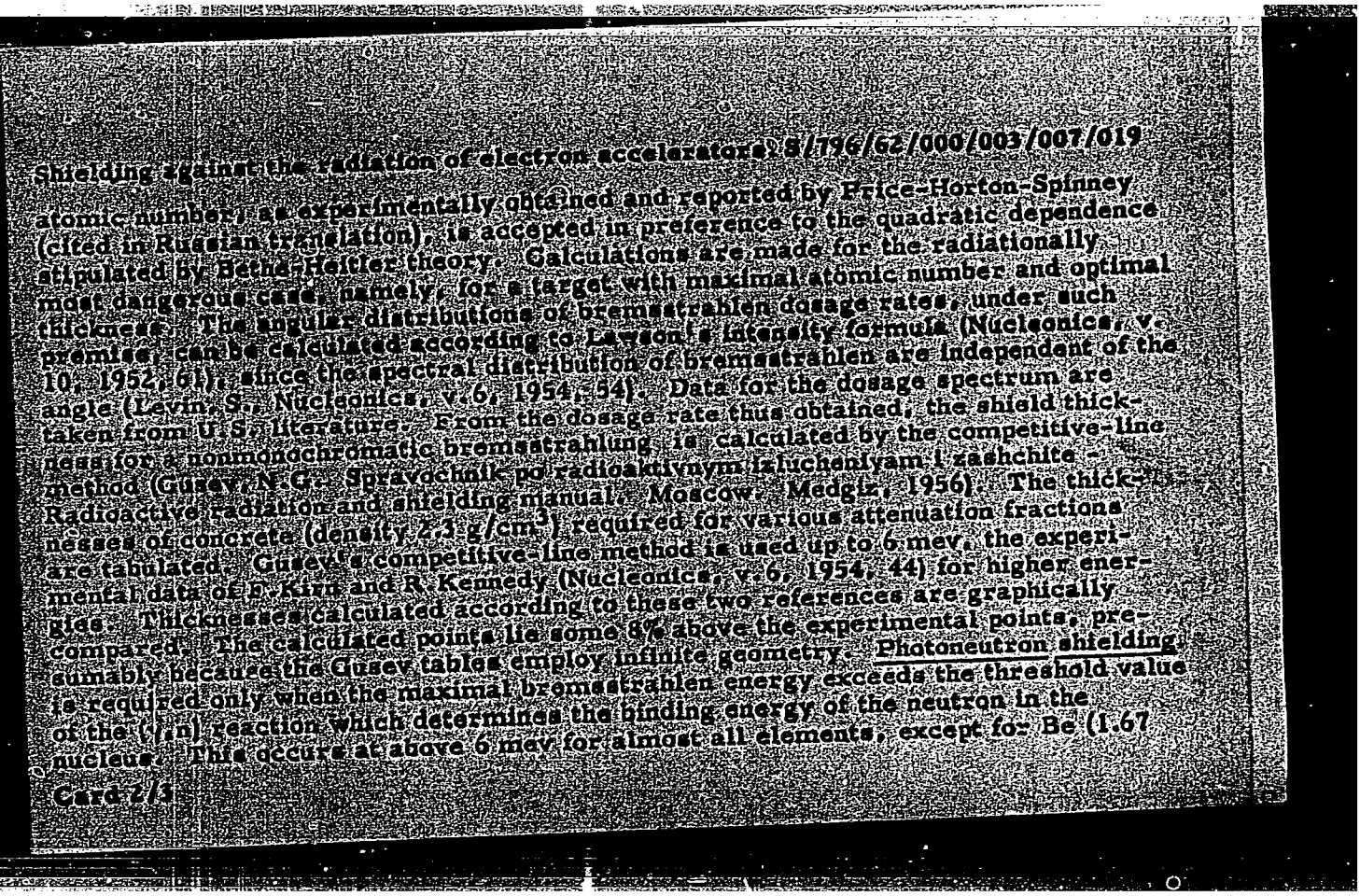
AUTHORS: Kimel', L.R., Mikhkovich, V.P., Panchenko, A.M.

TITLE: Shielding against the radiation of electron accelerators with a maximum

SOURCE: Moscow. Inzhenerno-fizicheskiy institut. Zribory i metody analiza izlucheniy. no.3. 1962. 71-78

TEXT: The paper expounds a simplified method and initial data indispensable for the calculation of shielding against bremsstrahlung and photoneutron radiation for accelerators with a maximum accelerated-electron energy of 30 mev. The electron beam is treated as monoenergetic; in nonmonoenergetic beams the energy distribution spectrum of the electrons can be divided into energy intervals, and each interval is then treated as a monoenergetic beam. Shielding calculations require a knowledge of the distribution of the dosage fields of the bremsstrahlung and the photoneutron fluxes around the target, also their spectral distribution. Shielding thicknesses for either type of radiation are first calculated separately, whereupon the shield thicknesses required to afford protection against both radiations are selected. Bremsstrahlen shielding: The bremsstrahlen dosage rate is a function of the target flux, the electron energy, the atomic number, and the target thickness. The linear dependence of the integral intensity of the bremsstrahlen on the target

Card 1/3



Shielding against the radiation of electron accelerators. S/196/62/000/003/007/019

atomic number, as experimentally obtained and reported by Price-Horton-Spinney (cited in Russian translation), is accepted in preference to the quadratic dependence stipulated by Bethe-Heitler theory. Calculations are made for the radiationally most dangerous case, namely, for a target with maximal atomic number and optimal thickness. The angular distributions of bremsstrahlen dosage rates, under such premises, can be calculated according to Lawson's intensity formula (Nucleonics, v. 10, 1952, 61); since the spectral distribution of bremsstrahlen are independent of the angle (Levin, S., Nucleonics, v.6, 1954, 54). Data for the dosage spectrum are taken from U.S. literature. From the dosage rate thus obtained, the shield thickness for a nonmonochromatic bremsstrahlung is calculated by the competitive-line method (Gusev, N.G., Spravochnik po radioaktivnym izlucheniyam i zashchite - Radioactive radiation and shielding manual. Moscow, Medgiz, 1956). The thicknesses of concrete (density 2.3 g/cm^3) required for various attenuation fractions are tabulated. Gusev's competitive-line method is used up to 6 mev, the experimental data of P. Kirn and R. Kennedy (Nucleonics, v.6, 1954, 44) for higher energies. Thicknesses calculated according to these two references are graphically compared. The calculated points lie some 8% above the experimental points, presumably because the Gusev tables employ infinite geometry. Photoneutron shielding is required only when the maximal bremsstrahlen energy exceeds the threshold value of the (γn) reaction which determines the binding energy of the neutron in the nucleus. This occurs at above 6 mev for almost all elements, except for Be (1.67

Card 2/3

Shielding against the radiation of electron accelerators. S/[illegible]/62/000/003/007/019

Mev) and D (2.23 mev). The photoneutron flux is a function of the maximal bremsstrahlen energy, the atomic number, and the target geometry. For greatest safety, unless other stipulations are made, a target with high atomic number, e.g., U, which releases the greatest number of photoneutrons, is selected for shielding calculations. Photoneutron outputs per ma of flux versus impinging-electron energy for Cu, Pb, Bi, and U targets are taken from V.I.Gomonay, et al. (Atomnaya energiya, v.7, no.5, 1959, 476); using these outputs, and assuming the angular neutron distribution to be isotropic (Price, G., et al., Phys.Rev., v.77, 1950, 806), the neutron intensity at any given distance is calculated as a function of the electron flux on the target. The maximal energy of the photoneutrons is obtained from the difference between the maximal energy of the bremsstrahlung and the binding energy of the neutron in the target-substance nucleus; the photoneutron spectrum is assumed to have a Maxwellian distribution in which the maximum is shifted toward the weaker energies. From the solid-angle and the spectral distributions thus obtained, the required attenuation fraction can be calculated; whence the wall thickness follows. A specific numerical example is illustrated. The frontal wall of the sample shielding is designed for bremsstrahlung, the other three for photoneutron protection. Thanks expressed to O.I. Leypunskiy, N.G.Gusev, and Ye.L.Stolyarova for valuable advice. There are 6 figures, 1 (unnumbered) table, and 15 references (4 Russian-language Soviet and 11 U.S. references, of which 9 are in English, 2 in Russian translation).

ASSOCIATION: None given.

Card 3/3

S/196/62/000/003/011/019

AUTHOR: Mashkovich, V.P.

TITLE: Threshold detectors for the measurement of fast-neutron fluxes and spectra.

SOURCE: Moscow. Inzhenerno-fizicheskiy institut. Pribory i metody analiza izlucheniy. no. 3. 1962. 105-114.

TEXT: A general review is set forth of the measurement of fast-neutron fluxes and spectra by means of detectors that are sensitive to neutrons having energies above a specified threshold value. The threshold reaction (n, 2n) serves for an energy threshold of appx. 9 mev; the reactions (n, α) and (n, p) are utilized in the energy range of 1-15 mev; the (n,f) reaction is not considered here. These reactions create isotopes with halflives of minutes to days, having a reaction cross-section which retains a small value up to the energy threshold and then increases gradually with increasing energy. Isotopes with a nearly constant reaction cross-section for a broad energy range serve as "all-wave" threshold detectors. An expression is provided for the activity of a threshold detector induced by a time-invariant neutron flux after a time t following an exposure time T at a distance r from a given source, neglecting the decay of activity. Decay curves are provided

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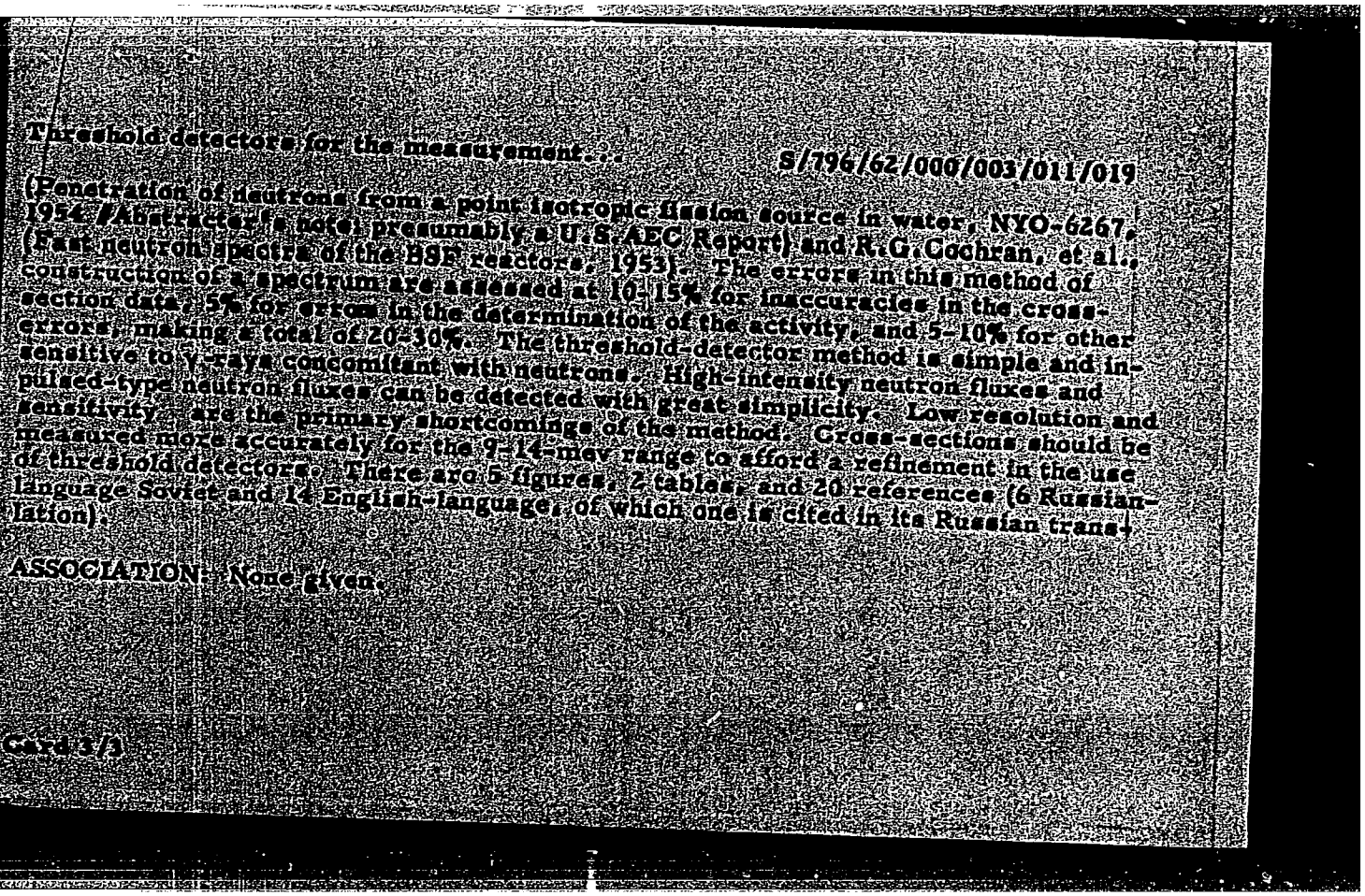
for Si[31]. Attention is drawn to the problem of distinguishing extraneous activity when the respective halflives of the principal and the extraneous activity almost coincide. Then differentiation can best be obtained by the spectrometric method (cf. Mashkovich, V.P., et al., Atomnaya energiya, v.11, no.3, 1961, 251). The basic characteristics of the most widely employed indicators are tabulated in a full-page table. The corresponding cross-sections are graphed against energy (1-16 mev). The practical use of the various indicators is discussed with reference to Wood, D., Nucl. Sci. Engrg., no.5, 1959, 45; and Motteff, I., The use of threshold and resonance foils, England, 1958). The neutron spectrum can be determined with an array of threshold detectors (cf. Belov, S.P., et al., Atomnaya energiya, v.6, 1959, 663; Dulin, V.A., et al., ibid., v.9, no.4, 1960, 318; Hurst, D., et al., Trans. First Internat'l Conf. on the peaceful uses of atomic energy, 1956). The importance of an experimental knowledge of the value of ϵ_i is stressed; methods for its measurement are outlined, and a tabulation of values for several indicators is provided. Experimental data obtained with threshold indicators on the BF-5 (BR-5) reactor are adduced (cf. Dulin, V.A., et al., Atomnaya energiya, v.9, no.4, 1960, 315). The total flux of fast neutrons, the change of the flux as a function of the transverse distance h from the axis of the beam, and the spectrum from a punctuate [illegible] at a depth of 10 cm in water are graphed; the latter is also com- [illegible] proved by M. Aveasan, et al.

Card 2/3



Threshold detectors for the measurement... S/796/62/000/003/011/019

(Penetration of neutrons from a point isotropic fission source in water, NYO-6267, 1954 /Abstracter's note: presumably a U.S.AEC Report) and R.G.Cochran, et al., (Fast neutron spectra of the HSF reactors, 1953). The errors in this method of construction of a spectrum are assessed at 10-15% for inaccuracies in the cross-section data; 5% for errors in the determination of the activity, and 5-10% for other errors, making a total of 20-30%. The threshold-detector method is simple and insensitive to γ-rays concomitant with neutrons. High-intensity neutron fluxes and pulsed-type neutron fluxes can be detected with great simplicity. Low resolution and sensitivity are the primary shortcomings of the method. Cross-sections should be measured more accurately for the 9-14-mev range to afford a refinement in the use of threshold detectors. There are 5 figures, 2 tables, and 20 references (6 Russian-language Soviet and 14 English-language, of which one is cited in its Russian translation).

ASSOCIATION: None given.

Card 3/3

42557

S/089/62/013/005/009/012
B102/B104

94.6830

AUTHORS: Gusev, N. G., Mashkovich, V. P., Verbitskiy, B. V.

TITLE: Universal tables for calculating the gamma radiation attenuation in thin filters

PERIODICAL: Atomnaya energiya, v. 13, no. 5, 1962, 480-481

TEXT: For lead, iron, and aluminum filters of the thicknesses d = 0.1, 0.3, 0.5, 1.0 and 1.5 cm the attenuation rates 1/K are tabulated for gamma quanta of $0.1 \leq h\nu \leq 4.0$ Mev. $K = e^{\mu d}/B$, μ being the linear attenuation coefficient and B the dose factor of gamma quantum accumulation (cf. G. White, Res. Nat. Bur. Stand., 583, 1957) calculated by the Monte-Carlo method. The data given hold for lead of 11.34 g/cm^3, iron of 7.89 g/cm^3 and aluminum of 2.7 g/cm^3 and are corrected for barrier effects. They were also verified experimentally by using isotropic point sources (Hg^{203}, Cs^{137}, Co^{60} and Ra) and were found to agree within the limits of measurement error (2-6%). There are 3 tables.

Card 1/2

Universal tables for calculating ... S/089/62/013/005/009/012
B102/B104

SUBMITTED: April 26, 1962

Card 2/2

ACCESSION NR: AT4021254 S/2892/63/000/002/0081/0087

AUTHOR: Gusev, N. G., Mashkovich, V. P.

TITLE: On the question of determining γ constant radioactive isotopes

SOURCE: Voprosy* dozimetrii i zashchity* ot izlucheniy, no. 2, 1963, 81-87

TOPIC TAGS: γ constant, radioactive isotope, decay isotope, radium 226, radium D

ABSTRACT: An attempt is made by the author to calculate the γ radiation of daughter products in a γ constant if, at the initial moment, the parent isotope only is available. By means of mathematical arguments, he arrives at

$$K'_{\gamma} = \frac{K_{\gamma 1} + K_{\gamma 2}\eta_2 + K_{\gamma 3}\eta_3 + \ldots + K_{\gamma n}\eta_n}{1 + \eta_2 + \eta_3 + \ldots + \eta_n} =$$

$$= \frac{K_{\gamma 1} + \sum_{i=2}^{n} K_{\gamma 1}\eta_i}{1 + \sum_{i=2}^{n} \eta_i} \qquad (2)$$

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ACCESSION NR: AT4021254

where K'_γ is the total activity of the parent and all daughter isotopes, K_1 is the γ constant of the parent isotope, K_{i+1} is the γ constant of the (i - 1)th daughter isotope, η_i is the adjustment coefficient for the (i - 1)th daughter isotope, (n - 1) is the number of daughter isotopes in the chain of radioactive decay. By means of this equation, the task of determining the γ constants of isotopes K_γ and K'_γ by considering the γ radiation of all daughter products, leads to the finding of the number of radioactive atoms for each of the isotopes in the decay chain dependent on time. Examples such as 20 calcium 47 series are used to verify the mathematics. The introduction of the adjustment coefficients η_i enables the γ constant of the isotope to be correctly calculated by considering the change in time of the contribution of the daughter products' γ radiation dose. Orig. art. has: 12 formulas and 1 figure.

ASSOCIATION: Moskovskiy inzhenerno-fizicheskiy institut (Moscow Physics and Engineering Institute)

SUBMITTED: 00 DATE ACQ: 06Apr64 ENCL: 00

SUB CODE: PH, NS NO REF SOV: 006 OTHER: 001

Card 2/2

S/2892/63/000/002/0088/0090

ACCESSION NR: AT4021255

AUTHOR: Mashkovich, V. P., Sakharov, V. K.

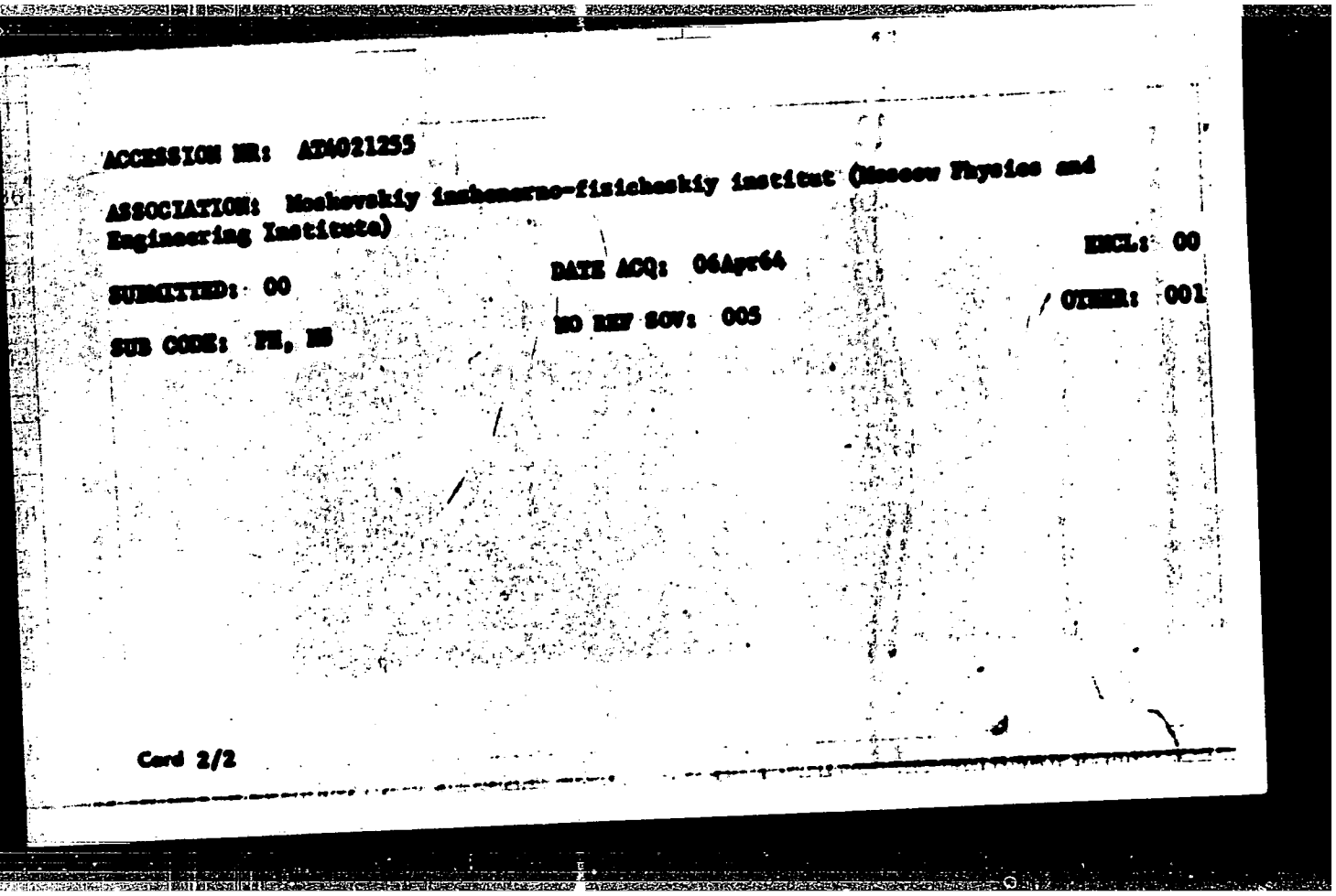
TITLE: Universal tables for calculation of γ radiation attenuation in thin tin filters

SOURCE: Voprosy* dozimetrii i zashchity* ot izlucheniy, no. 2, 1963, 88-90

TOPIC TAGS: universal table, γ rays, β radiation, tin filters

ABSTRACT: The problem of determining the attenuation of γ radiation after passing through a filter is studied in this paper. The authors have constructed a universal table which should aid in determining the degree of attenuation. Calculations of γ radiation attenuation in a tin filter ($\rho = 7.29$ g/cm^3) are conducted. Results of the calculations in the form of the dependence of $1/k$ of 1, 2, 3, 4 and 5 mm are given in the table and figure. Orig. art. has: 1 figure, 1 formula, and 1 table.

Card 1/2



ACCESSION NR: AM4021255

ASSOCIATION: Moskovskiy inzhenerno-fizicheskiy institut (Moscow Physics and Engineering Institute)

SUBMITTED: 00 DATE ACQ: 06Apr64 ENCL: 00

SUB CODE: PH, NP NO REF SOV: 005 OTHER: 001

Card 2/2

S/2892/63/000/002/0091/0099

ACCESSION NR: AT4021256

AUTHOR: Kramer-Ageyev, Ye. A., Moshkovich, V. P.

TITLE: Shielding of laboratory neutron sources

SOURCE: Voprosy* dozimetrii i zashchity* ot izlucheniy, no. 2, 1963, 91-99

TOPIC TAGS: neutron source, shield, attenuation, water shield, neutron radiation, nomograph, energy distribution, radiometer, γ radiation, paraffin shield

ABSTRACT: The basic characteristics of neutron sources in the (α,n) reaction are given. Nomographs for calculating a water shield from isotropic neutron point sources are drawn. Four types of nomographs are plotted according to the design of a γ radiation shield. The authors claim that the calculated nomographs are correct for an infinite water medium. A paraffin shield can be of 1.2 times less thickness than the water shield, defined by the nomographs. In conclusion, the authors point out that neutron radiation accompanies the source γ radiation. Therefore, the suitability of the selected water or paraffin thickness must be checked from the viewpoint of protection against γ radiation. Analytic results dictate the introduction of heavy components into the shielding content. Orig. art. has: 7 figures and 2 tables.

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MOSCOW ENGINEERING-PHYSICS INST.

S/2892/63/000/002/0109/0115

ACCESSION NR: AT4021258

AUTHOR: Mashkovich, V. P.

TITLE: Nomographs for calculation of a protection against radiation from electron accelerators with a maximum accelerated electron energy of up to 30 MeV

SOURCE: Voprosy* dozimetrii i zashchity* ot izlucheniy, no. 2, 1963, 109-115

TOPIC TAGS: nomograph, shield, electron accelerator, ionizing radiation, Bremsstrahlung, photoneutron

ABSTRACT: The purpose of this paper is to plot nomographs for the calculation of protective shielding against radiation from electron accelerators, on the basis of results obtained by L. R. Kimel, V. P. Mashkovich, and A. M. Panchenko (Pribory i metody analiza izlucheniy. Vy*p. 3, M., Gosatomizdat, 1962, p. 71). The author derives the power of the Bremsstrahlung dose at a point with coordinates (R,θ) about the accelerator target, according to formula

$$P(R,\theta) = \frac{P_0(\theta)I}{10^3 \cdot R^2} \text{ (Roentgens/min.)} \quad (1)$$

The flow of photoneutrons is calculated according to the formula

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ACCESSION NR: AT4021258

$$N(R) = \frac{QI}{4\pi \cdot 10^3 \cdot 10^4 \cdot R^2} \text{ (neutrons/cm}^2\text{/sec)} \quad (2)$$

The author also determines the amount of attenuation and plots nomographs for various parameters. The nomographs are especially suitable for evaluative calculations in the selection of an optimum modification in the accelerator installation and the thickness of the shielding walls. The author expresses his profound thanks to V. V. Pushkin for conducting evaluative calculations. Orig. art. has: 6 formulas, 3 figures, and 1 table.

ASSOCIATION: Moskovskiy inzhenerno-fizicheskiy institut (Moscow Physics and Engineering Institute)

SUBMITTED: 00 DATE ACQ: 06Apr64 ENCL: 00

SUB CODE: NS, PH NO REF SOV: 003 OTHER: 000

Card 2/2

KRAMER-AGEYEV, Ye.A.; MASHKOVICH, V.P.

Nomograms for calculating the water shielding against neutrons from (α, n)-sources. Atom. energ. 15 no.2:160-161 Ag '63. (MIRA 16:8)

(Nomography (Mathematics)) (Shielding (Radiation))

ACCESSION NR: AT4019046 S/0000/63/000/000/0182/0190

AUTHOR: Mashkovich, V. P.; Sakharov, V. K.; Tsy°pin, S. G.

TITLE: Spatial-energy distribution of neutrons in thick layers of iron

SOURCE: Voprosy° fiziki zashchity° reaktorov; sbornik statey (Problems in physics of reactor shielding; collection of articles). Moscow, Gosatomizdat, 1963, 182-190

TOPIC TAGS: neutron energy distribution, iron prism, relaxation length, attenuation function, neutron spatial distribution, neutron, reactor shielding, iron shielding, neutron spectrum

ABSTRACT: The spatial and energy distribution of fast and intermediate neutrons in iron was studied because of the importance of iron in reactor shielding and the insufficiency of existing data. A BR-5 reactor was used as a neutron source and the neutron spectrum was determined on 200μ thick photographic film with type K emulsion. The neutron beam was directed onto an iron prism (dimensions 1320 x 1360 x 1660 mm) after passing into a reservoir through a channel 250 mm in diameter. The angular divergence of the beam was 5°. For detection of fast neutrons, the following threshold detectors were used: $Sn^{32}(n,p)P^{32}$, $Mg^{24}(n,p,)Na^{24}$, $Al^{27}(n,\alpha)Na^{24}$, and a Th^{232} fission

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ACCESSION NR: AT4019046

chamber; for intermediate neutrons: a BF_3 counter type SNM-3, $Cu^{63}(n, \gamma) Cu^{64}$, and the indicator $Au^{197}(n, \gamma) Au.^{196}$ Detectors were placed at various distances r from the source and at different heights perpendicular to the beam. Counting rates from tin and aluminum detectors and the thorium chamber as a function of height for different distances r were evaluated separately. The spatial distribution as a function of height at fixed r as registered by copper and gold indicators and a boron counter is given in Fig. 1 of the Enclosure. Neutron attenuation for an infinite planar unidirectional neutron source was given by the equation $G_{\infty p}(r) C = \int_0^\infty G_{DM}(r, h) dh$ and is shown in Fig. 2 of the

Enclosure as determined by Cu, Au and BF_3. Relaxation lengths as measured by different detectors and calculated values of asymptotic cross-sections in the transport approximation for several energy groups are tabulated in the original paper. "The authors are indebted to O. I. Leypunskiy and V. V. Orlov for valuable comments during this work". Orig. art. has: 11 figures, 3 tables and 1 formula.

ASSOCIATION: None

SUBMITTED: 14Aug63 DATE ACQ: 27Feb64 ENCL: 02

SUB CODE: NP NO REF SOV: 010 OTHER: 004

Card 2/4

ACCESSION NR: AT4019046

ENCLOSURE: 01

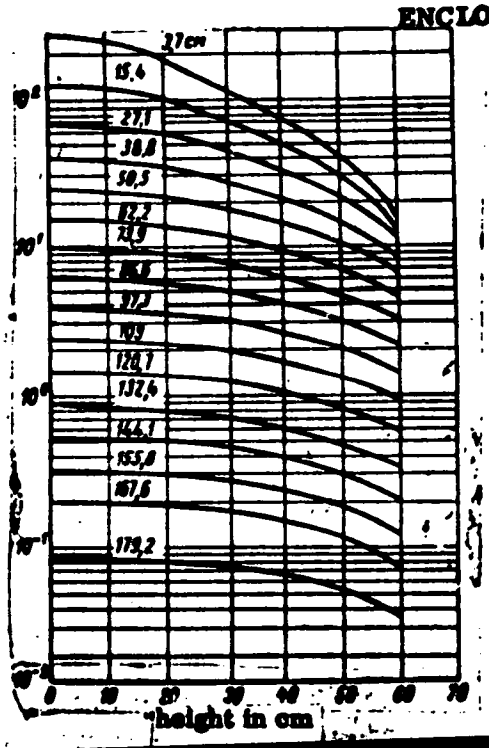

Fig. 1 - Measured neutron distribution at various value of the distance r.

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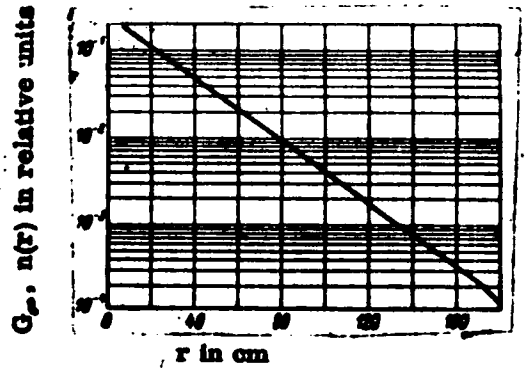

Fig. 2 - Attenuation function of neutrons from an infinite, planar, unidirectional source, measured by Cu, Au and BF_3 detectors.

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ACCESSION NR: AT4019062 S/0000/63/000/000/0277/0281

AUTHOR: Mashkovich, V. P.

TITLE: The measurement of streams of fast neutrons in shielding against the background of intensive streams of intermediate neutrons

SOURCE: Voprosy* fiziki zashchity* reaktorov; sbornik statey (Problems in physics of reactor shielding; collection of articles). Moscow, Gosatomizdat, 1963, 277-281

TOPIC TAGS: nuclear reactor, reactor shielding, neutron, neutron detection, radiation detector, decay curve, threshold detector, cadmium filter, radiation dosimetry, neutron attenuation

ABSTRACT: The author notes that in experiments with threshold indicators, induced activity is generally determined by the plotting of decay curves. On the basis of an analysis of these decay curves, the effect of extraneous admixtures (impurities) can be excluded. The case of detectors in which the half-lives of the accompanying activities are close or equal to the half-life of the basic activity is considered, and it is pointed out that when determining the basic activity of such threshold detectors two cases may occur in which

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ACCESSION NR: AT4019062

the accompanying activity takes the form of : 1) an isotope different from that of the basic activity but with a similar half-life; and 2) an isotope which is also formed as a result of the basic activity. Normally, both these cases are encountered when the indicator is radiated by fast neutrons against a background of large streams of thermal and intermediate neutrons. The author notes that the accompanying activity, formed by virtue of the thermal neutrons, can easily be eliminated by placing the detector in a cadmium filter, with the problem thus practically reduced to the measurement of the activity caused by the stream offast neutrons against the background of intensive streams of intermediate neutrons. A method for determining this activity is proposed and described in the article. Basically, this method involves the use of spectrometric techniques in the first case when, as a result of the basic activity, an isotope is formed which is different from the isotope of the accompanying activity. In the second case, the use of the spectrometric method is impossible because of the identical composition of the isotopic radiation. The basic activity can be discriminated only in the event that the fundamental and accompanying reactions occur in neutrons of different energy ranges and if these energy groups are weakened differently in the material of the shielding - which is true in the case of many materials

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ACCESSION NR: AT4019062

with average and high atomic weights. In this case, the attenuation curve of the neutron stream, measured by these detectors, will exhibit two clearly expressed sections caused by the acute attenuation of the fast neutrons (the first) and negligible attenuation of the intermediate neutrons (the second). Beginning at a certain thickness of the shielding, practically the entire activity of the threshold detector is caused by activation in the stream of intermediate neutrons. In this case, this section of the attenuation curve is extrapolated to the region of lesser thicknesses in accordance with an attenuation curve measured by a device which detects only intermediate neutrons. By subtracting from the corresponding values of the threshold detector activity caused by the activation in fast and intermediate neutrons, the corresponding activity caused by the intermediate neutrons, an attenuation curve for only the fast-neutron stream is obtained. The author notes that this method is applicable to the first case as well. Examples are given, illustrating the use of this method. Gamma-spectra accompany the exposition of the experiments. The author demonstrates graphically how it is possible to circumvent the difficulties which may arise when working with threshold indicators to measure fast-neutron streams against a heavy background of intermediate-energy neutrons. It is pointed out, in conclusion, that despite its somewhat complicated char-

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ACCESSION NR: AT4019062

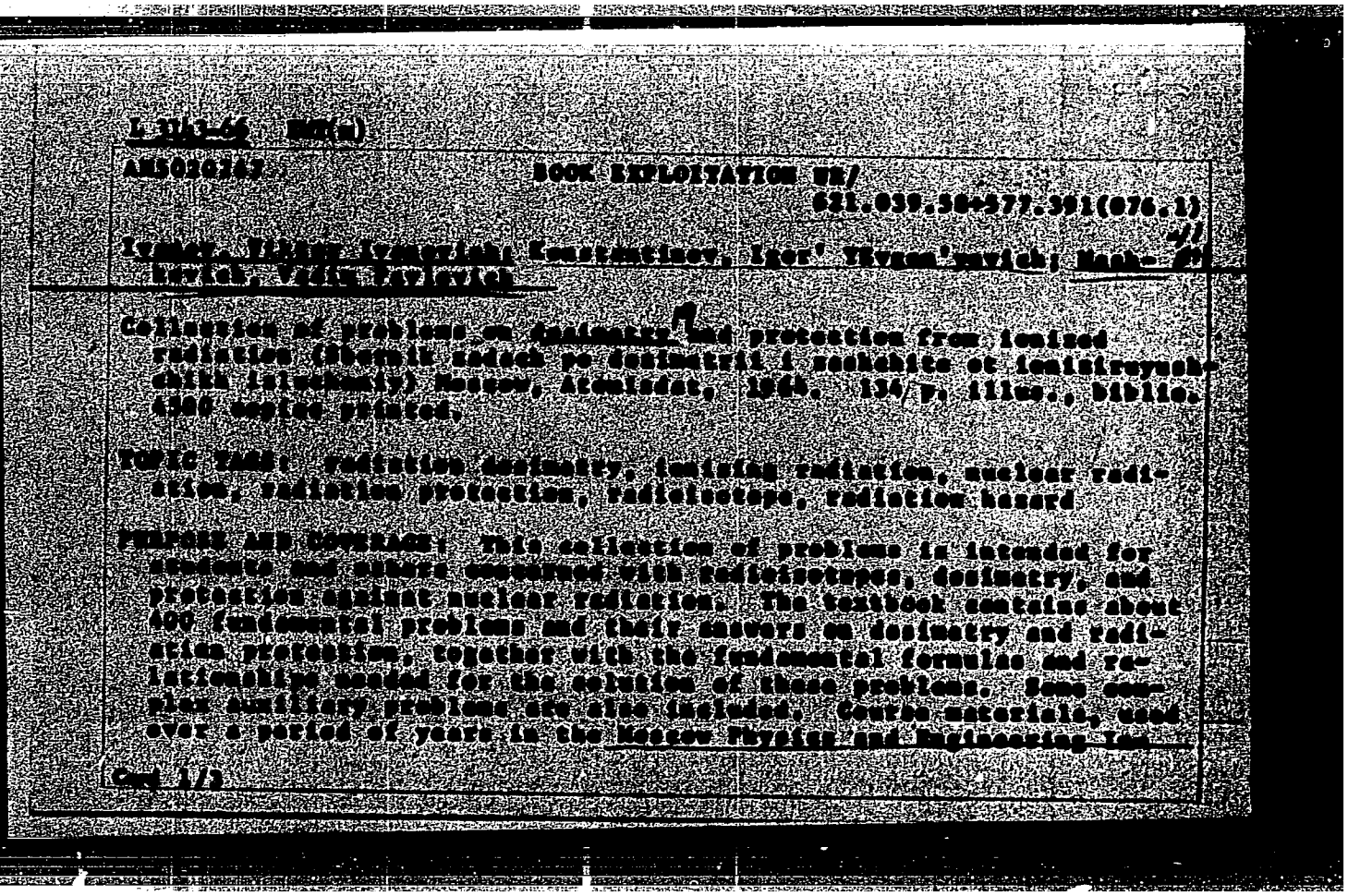
acter, this particular method must frequently be employed, inasmuch as threshold detectors possess a number of definite advantages, chief among them being non-sensitivity to gamma-rays and operational simplicity. "The author expresses sincere gratitude to O. I. Leypunskiy and S. B. Tsy*pin for their valuable comments in discussing this work, and to Yu. K. Yermakov who took part in the actual measurements." Orig. art. has: 3 figures and 1 formula.

ASSOCIATION: none

SUBMITTED: 14Aug63 DATE ACQ: 27Feb64 ENCL: 00

SUB CODE: NP NO REF SOV: 004 OTHER: 001

Card 4/4



L 37437-66 EWT(m)

AM5026343 BOOK EXPLOITATION UR/

621.039.58+577.391(076.1)

Zvonkov, Yuriy Ivanovich; Kuznetsov, Igor' Yevgen'yevich; Nash- [illegible]

Sbornik zadach po dozimetrii i zashchite ot ionizirovannykh izlucheniy (Collection of problems on dosimetry and protection from ionized radiation) Moscow, Atomizdat, 1965. 134 p. illus., bibliography, 4300 copies printed.

TOPIC TAGS: radiation dosimetry, ionizing radiation, nuclear radiation, radiation protection, radioisotope, radiation hazard

PURPOSE AND COVERAGE: This collection of problems is intended for students and others concerned with radioisotopes, dosimetry, and protection against nuclear radiation. The textbook contains about 400 fundamental problems and their answers on dosimetry and radiation protection, together with the fundamental formulas and relationships needed for the solution of these problems. Some complex auxiliary problems are also included. Course materials, used over a period of years in the Moscow Physics and Engineering Ins-

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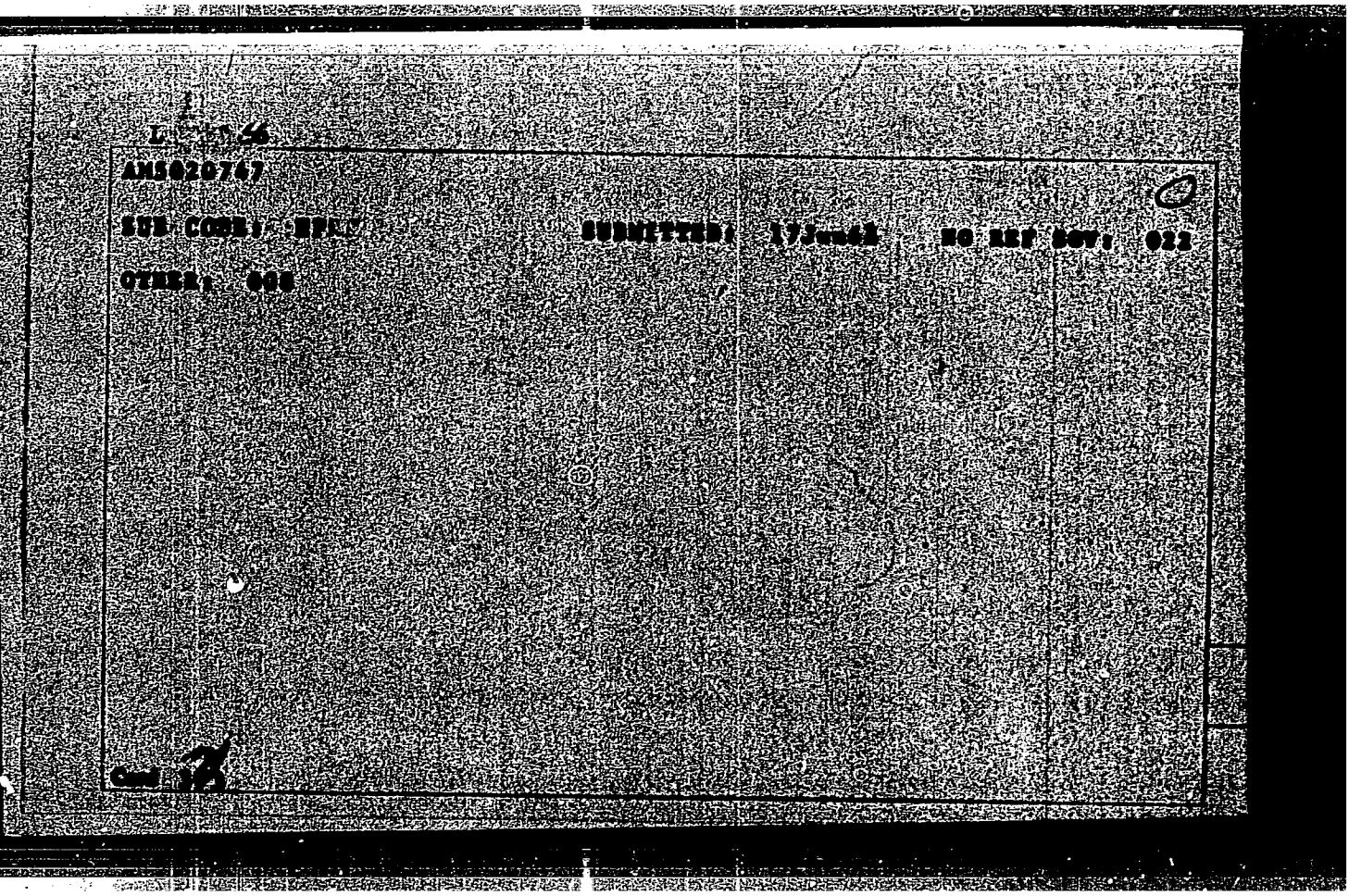
stitute, have been availed of in the compilation of this book. No personalities are mentioned.

TABLE OF CONTENTS: (Abridged)



L 28404-65 EWT(m)/EPF(n)-2/T/EPA(bb)-2 Pu-4

ACCESSION NR: AP5003279 S/2892/64/000/003/0025/0029

AUTHOR: Kimel', L. R.; Mashkovich, V. P.

TITLE: The use of removal cross sections during the calculation of neutron shielding

SOURCE: Moscow. Inzhenerno-fizicheskiy institut. Voprosy dozimetrii i zashchity ot izlucheniy, no. 3, 1964, 25-29

TOPIC TAGS: fast neutron, removal cross section, neutron shielding, neutron attenuation, reactor shielding, concrete

ABSTRACT: B. I. Sinitsyn and B. G. Tsypin (Atomnaya energiya, 12, 4, 306, 1962) discovered that in the case of fission neutrons in elementary media, the measured relaxation length for detectors with energy thresholds of about 3 Mev coincides with the one calculated on the basis of removal cross sections (G. T. Chapman, C. L. Storrer. Effective neutron removal cross section for shielding. USAEC, ARCD-3978, 1955). The present work studied the applicability of the above-mentioned procedures to the attenuation of fast neutrons in media representing a mixture of elements (e. g., concrete). In the case of three different types of

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L 24404-65

ACCESSION NR: AM5003279

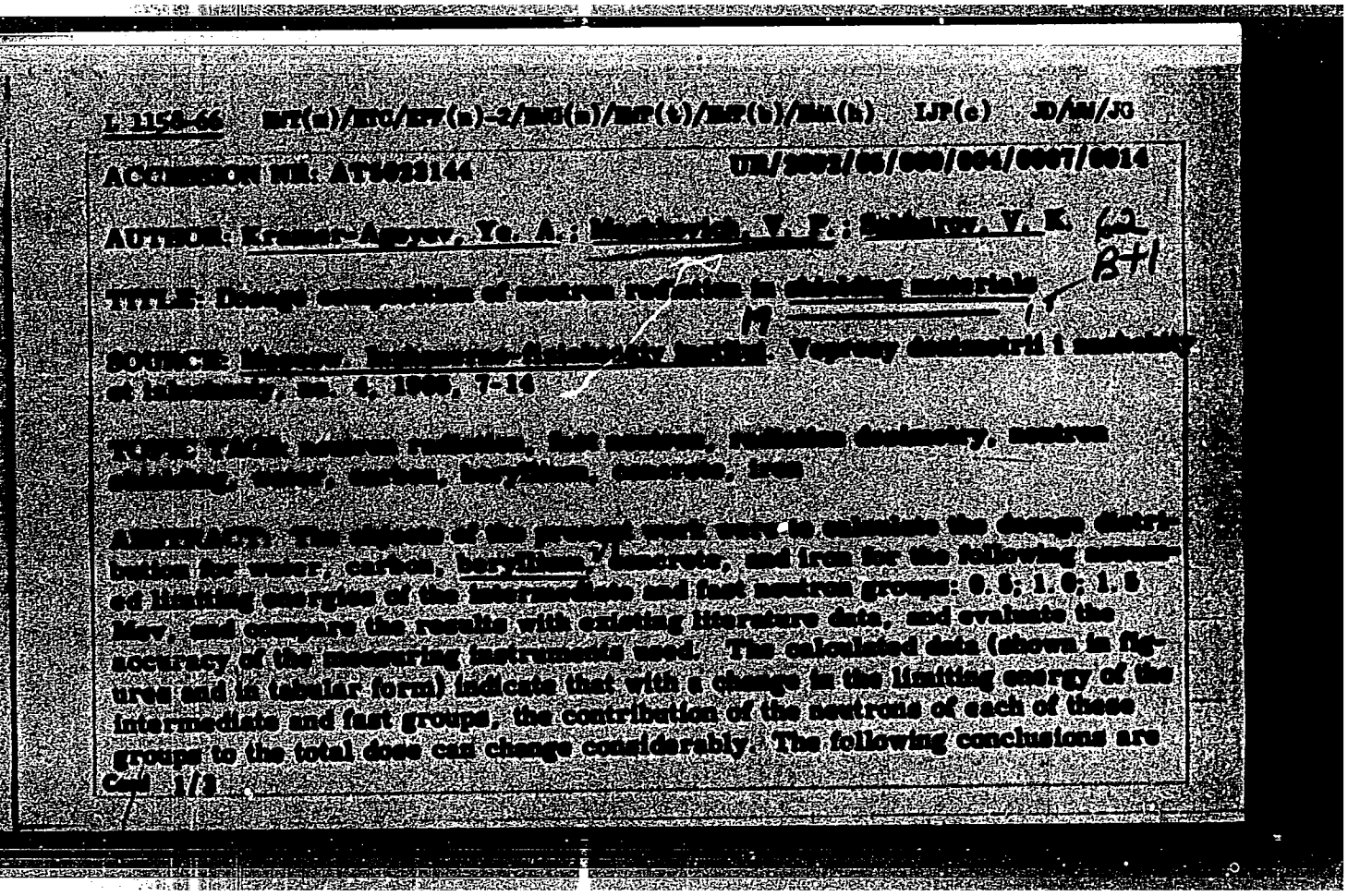
concrete; calculations using the law of addition showed excellent agreement with experimental data concerning neutron cross sections for energies above 3 Mev (E. G. Peterson, Shielding properties of ferrophosphorous concrete as a function of temperature. USAEC Rep. HW-64774, July 15, 1960). The article also contains a table of macroscopic removal cross sections in 31 elements and 48 compounds compiled from various references. "The authors thank Yu. Anokhin for help during the calculations." Orig. art. has: 1 formula and 3 tables.

ASSOCIATION: None

SUBMITTED: 00 ENCL: 00 SUB CODE: NP

NO REF SOV: 002 OTHER: 006

Card 2/2



L 1158-66 EWT(d)/EWG/EWT(m)-2/EWG(m)/EWP(t)/EWP(b)/EWA(h) IJP(c) JD/WW/JG

ACCESSION NR: AT5023144 UR/2777/65/000/004/0007/0014

AUTHOR: Krumin-Agrov, Ye. A.; [illegible]; Shikov, V. K. 42 B+1

TITLE: Design comparison of neutron reflection in shielding materials 17

SOURCE: Moscow. Inzhenerno-fizicheskiy institut. Voprosy zashchity i zashchitnykh materialov, no. 4, 1965, 7-14

TOPIC TAGS: neutron reflection, fast neutron, neutron shielding, neutron shield, water, carbon, beryllium, concrete, iron

ABSTRACT: The purpose of the present work was to calculate the design shielding data for water, carbon, beryllium, concrete, and iron for the following neutron energies of the boundaries of the intermediate and fast neutron groups: 0.5; 1.0; 1.8 Mev, and to compare the results with existing literature data, and evaluate the accuracy of the measuring instruments used. The calculated data (shown in figures and in tabular form) indicate that with a change in the limiting energy of the intermediate and fast groups, the contribution of the neutrons of each of these groups to the total does not change considerably. The following conclusions are

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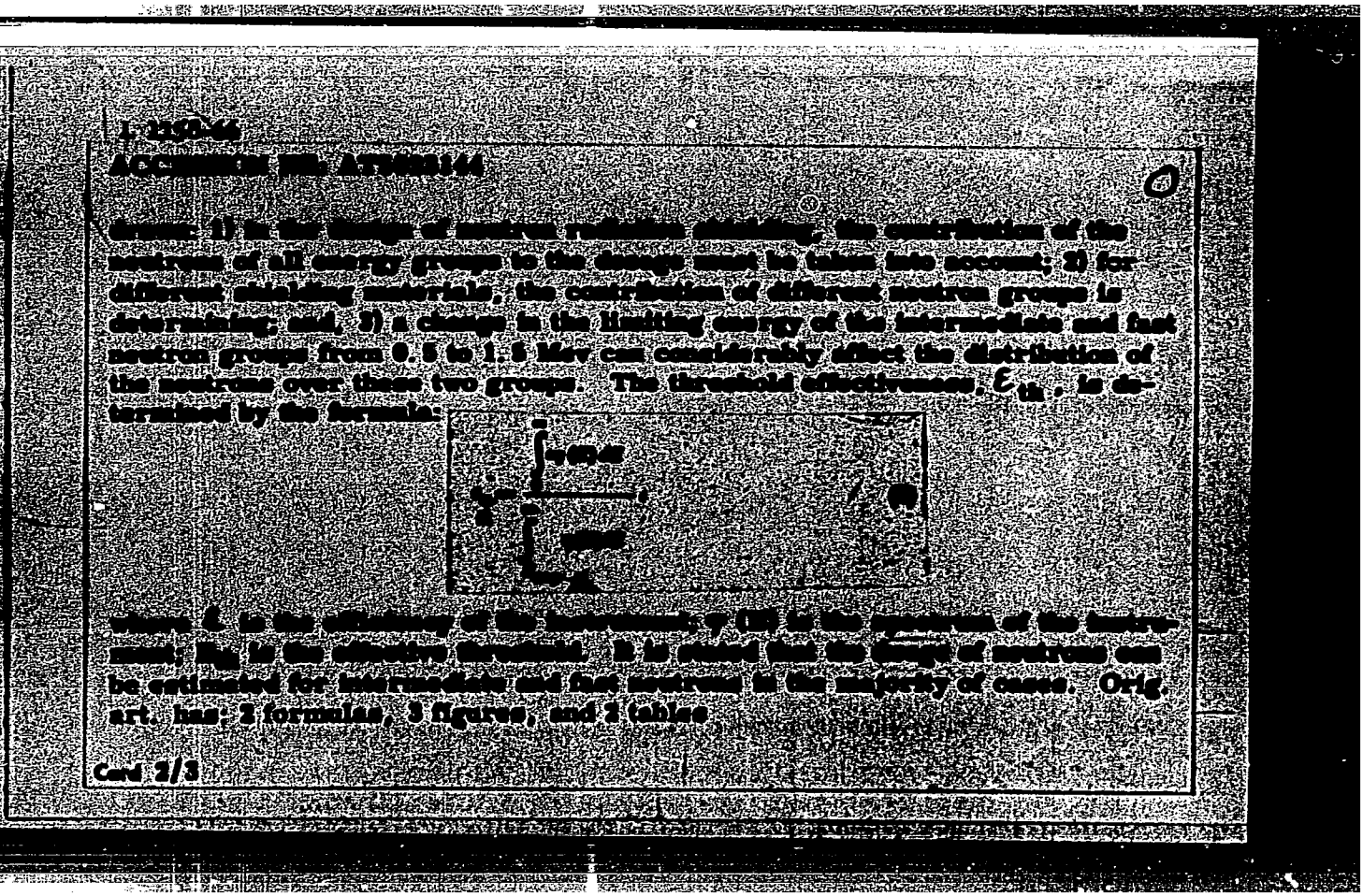
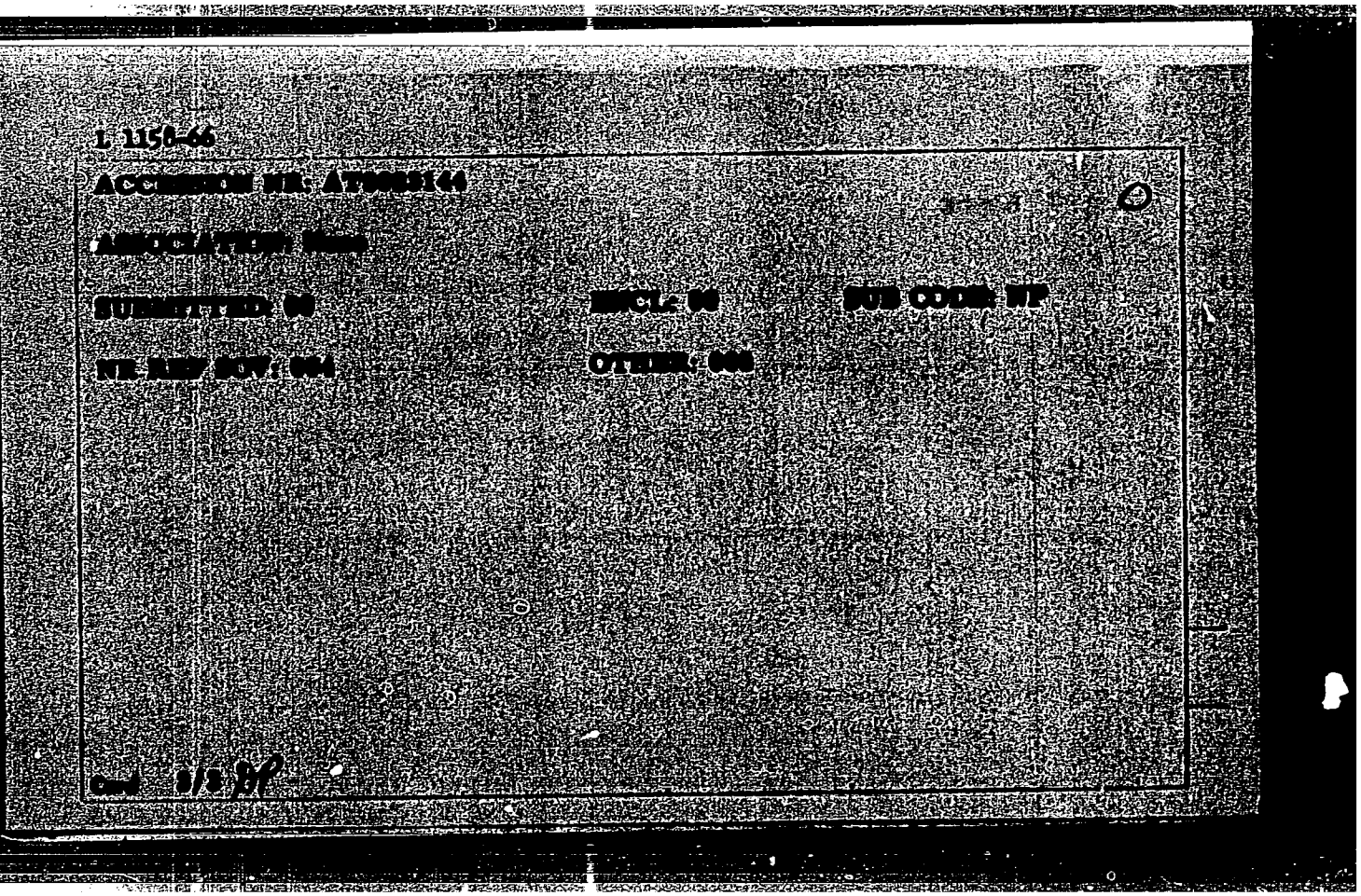


Card 2/3



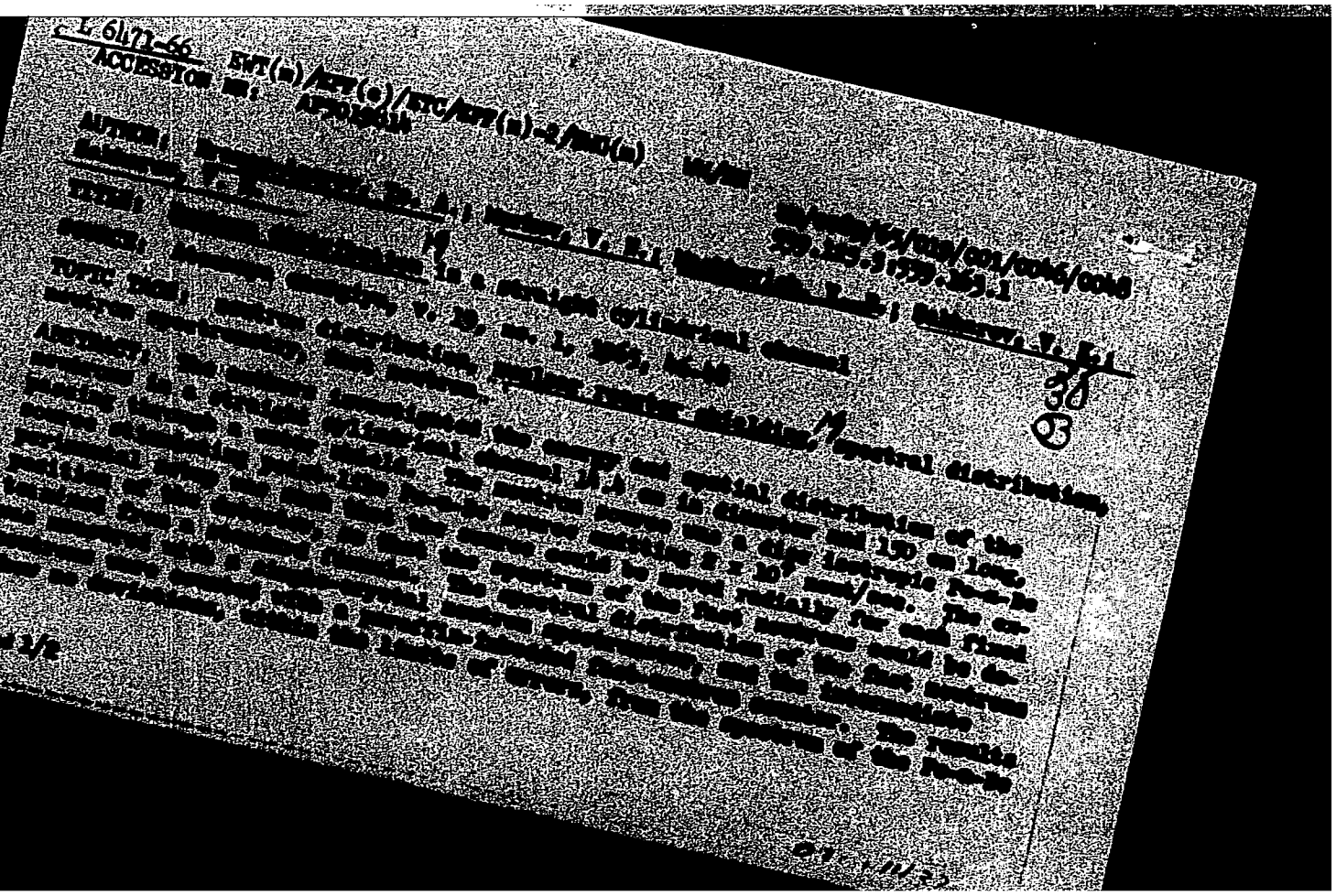
L 1150-66

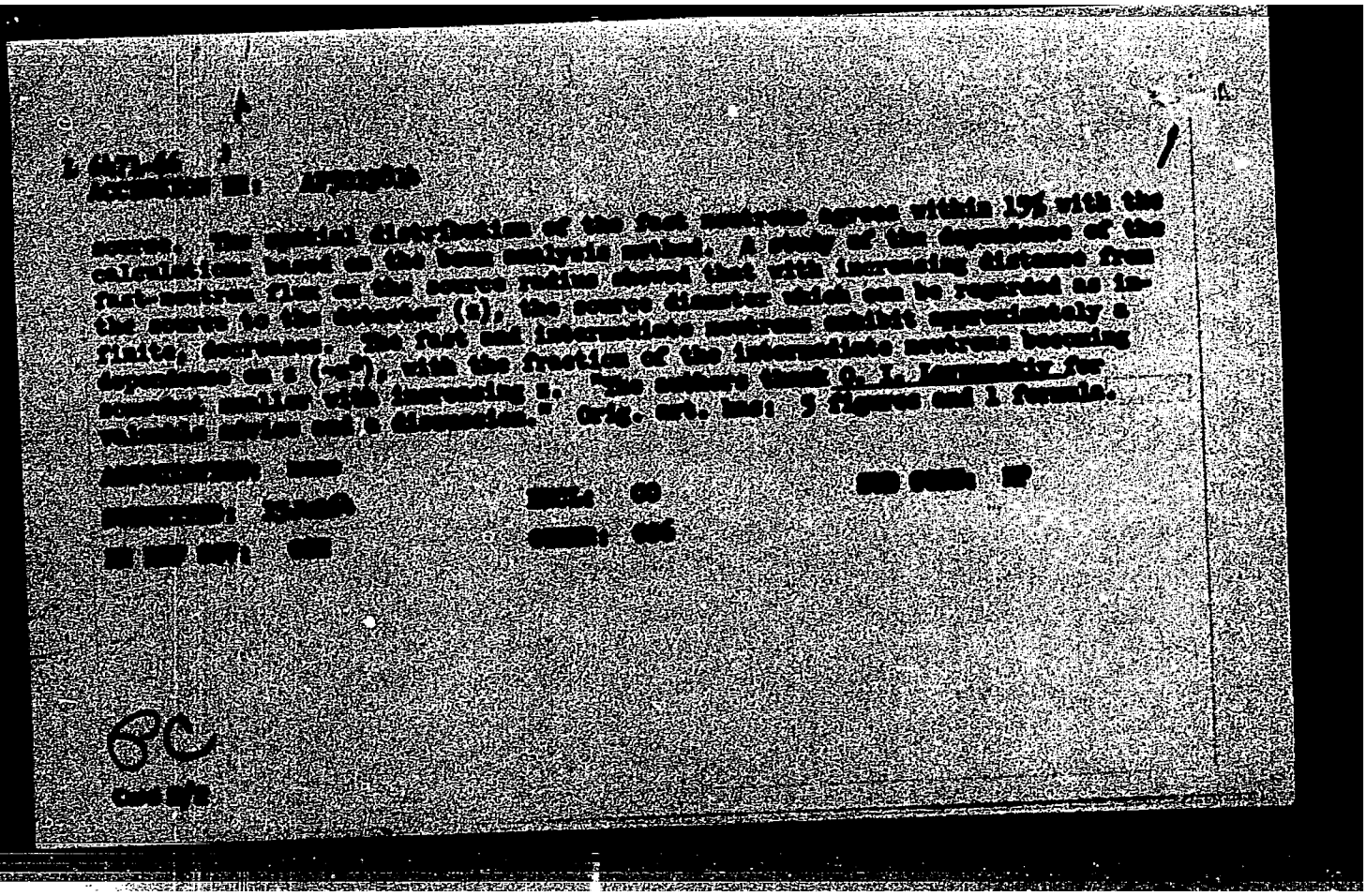
ACCESSION NR: AT5021[illegible]

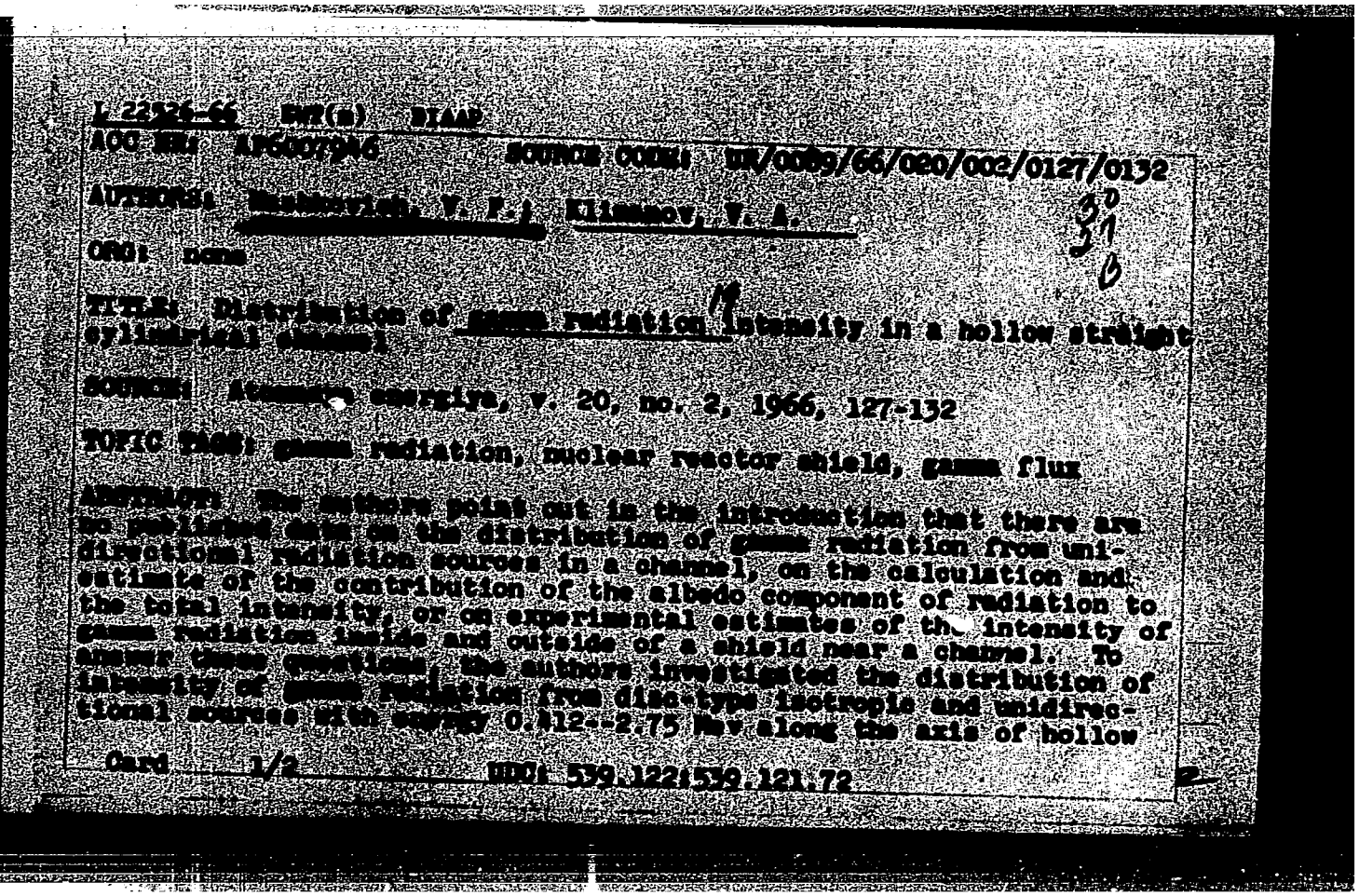
SUBMITTED: [illegible] ENCL: [illegible] SUB CODE: NP

NR REF SOV: [illegible] OTHER: [illegible]

Card 3/3







L 22326-66 EWT(m) DIAAP
ACC NR: AP6007946 SOURCE CODE: UR/0089/66/020/002/0127/0132
AUTHOR: [redacted], V. F.; Klimanov, V. A.
ORG: none
TITLE: Distribution of gamma radiation intensity in a hollow straight cylindrical channel
SOURCE: Atomnaya energiya, v. 20, no. 2, 1966, 127-132
TOPIC TAGS: gamma radiation, nuclear reactor shield, gamma flux
ABSTRACT: The authors point out in the introduction that there are no published data on the distribution of gamma radiation from uniformly distributed radiation sources in a channel, on the calculation and estimate of the contribution of the albedo component of radiation to the total intensity, or on experimental estimates of the intensity of gamma radiation inside and outside of a shield near a channel. To answer these questions the authors investigated the distribution of intensity of gamma radiation from disc-type isotropic and unidirectional sources with energy 0.512--2.75 Mev along the axis of hollow
Card 1/2 UDC: 539.122:539.121.72

L [illegible]-66
ACC NR: AP6007946

straight cylindrical channels passing through a shield. The shielding materials were water, concrete, and iron. An experimental procedure was used in which the total intensity could be subdivided into its direct radiation component, the component due to leakage through the shield, the component due to reflection of the directional component, and the component due to the reflection of the leakage component. Each component was calculated theoretically and measured experimentally. The results of the experiments and calculations agreed within approximately 15%. In the case of disc isotropic sources, the authors also measured the distribution of the intensity of gamma radiation inside and outside a water shield through which a straight cylindrical channel passes. The experimental data agree with the calculations based on the 'ray analysis method' with accuracy of about 20%. The authors thank O. I. Leypunskiy for interest in the work, [illegible], and [illegible] for help with the the measurements, and A. V. Frolova for the opportunity of making the x-ray measurements. Orig. art. has: 5 figures and 8 formulas.

SUB CODE: 20/ SUBM DATE: 29Jul65/ ORIG REF: 001/ OTH REF: 004

Card 2/2

L 06978-67 EWT(m) JR

ACC NR: AP6018353 (N) SOURCE CODE: UR/0089/66/020/005/0416/0418

AUTHOR: Nikolayev, A. N.; Sakharov, V. K.; Sinitsyn, B. I.; Mashkovich, V. P. 37 35 5

ORG: none

TITLE: Distribution of fast fission neutrons along straight cylindrical channels in water

SOURCE: Atomnaya energiya, v. 20, no. 5, 1966, 416-418

TOPIC TAGS: neutron distribution, fast neutron, neutron absorption, reactor shielding/B-2 reactor test equipment, BR-5 reactor nuclear

ABSTRACT: Inasmuch as earlier experimental and theoretical investigations of the passage of neutrons through slots and channels in shields have been restricted to neutrons from isotropic and cosinusoidal sources, the authors investigate the influence of straight cylindrical channels in water and the passage of fast fission neutrons from unidirectional sources. The experiments were made with installation B-2 of the BR-5 reactor. The neutron source was the active zone of the reactor. The straight cylindrical channels had diameters 144 and 90 mm. The neutron detectors were sulfur and aluminum threshold indicators, with respect to energy thresholds 3

Card 1/2 UDC: 539.125.52

L 06978-67

ACC NR: AP6018353

4

and 7 MeV. The distribution of the fast neutrons was determined by the β activity induced in the indicators, using a method described in an earlier paper (in: Voprosy fiziki zashchity reaktorov [Problems in Physics of Reactor Shielding], edited by D. L. Broder et al., Atomizdat, 1963, p. 182). Data are obtained on the attenuation of the flux of fast neutrons along the cylinder axis, from a disc and from an infinite plane unidirectional neutron source, and the influence of the shift of the tube axis relative to the source axis on the attenuation of the neutron radiation was studied. The information obtained can be used to calculate the passage of neutron radiation through steplike channels. The results show that shifting the channel axis relative to the source axis provides a very effective means of attenuating the neutron flux, since a change by five orders of magnitude could be obtained in some geometries. The authors thank A. A. Concharenko, P. I. Kotikov, V. M. Sakharov, and Yu. V. Khariscmenov for help with the experiments and the data reduction. Orig. art. has: 5 figures and 2 formulas.

SUB CODE: 18 SUBM DATE: 03Aug65/ ORIG REF: 004 OTH REF: 004

Card 2/2

MARKOVETS, V.V.; MICHKOV, L.V.

Vapor pressure over liquid alloys in the magnesium - selenium system. Zhur. prikl. khim. 38 no.5:1009-1014 My '65.
(MIRA 18:7)

1. Leningradskiy tekhnologicheskiy institut imeni Lensoveta.

MASHOVETS, V.P.; KRUMGAL'Z, B.S.; DIBROV, I.A.

Calculation of the activity coefficients of a dissolved substance based on the data on saturated vapor pressure of electrolyte solutions at high temperatures. Zhur. fiz. khim. 39 no.10:2486-2490 O '65. (MIRA 18:12)

1. Leningradskiy tekhnologicheskiy institut imeni Lensoveta. Submitted July 21, 1964.

Mashkovskiy, A.

93-5-19/19

AUTHOR: Mashkovskiy, A.

TITLE: A Useful Textbook on Economic Analysis (Poleznoye posobiye po ekonomicheskomu analizu)

PERIODICAL: Neftyanoye Khozyaystvo, 1957, Nr 5, pp. 70-71 (USSR)

ABSTRACT: A. A. Reznik's book "Principles of Economic Analysis of Oil Field and Drilling Department Operations, Gostoptekhizdat, 1957" is reviewed. It is contended that this book is the first one to throw light upon the problems of the analysis of oil field and drilling department operations. It starts with a statement of the purpose and functions of an economic analysis. The main chapters are devoted to the objectives and methods of analysis, and discuss the fundamental technical methods of processing oil field and drilling data for economic purposes. Individual chapters are criticized for certain minor deficiencies but on the whole it is contended that the book can well serve as a useful textbook for students at technical schools as well as a practical manual for the planning and engineering staff of oil field and drilling departments.

Card 1/2

93-5-19/19

A Useful Textbook on Economic Analysis (Cont.)

AVAILABLE: Library of Congress

Card 2/2

MASHKOVSKIY, Aleksandr Petrovich; VEREVKINA, N.M., red.

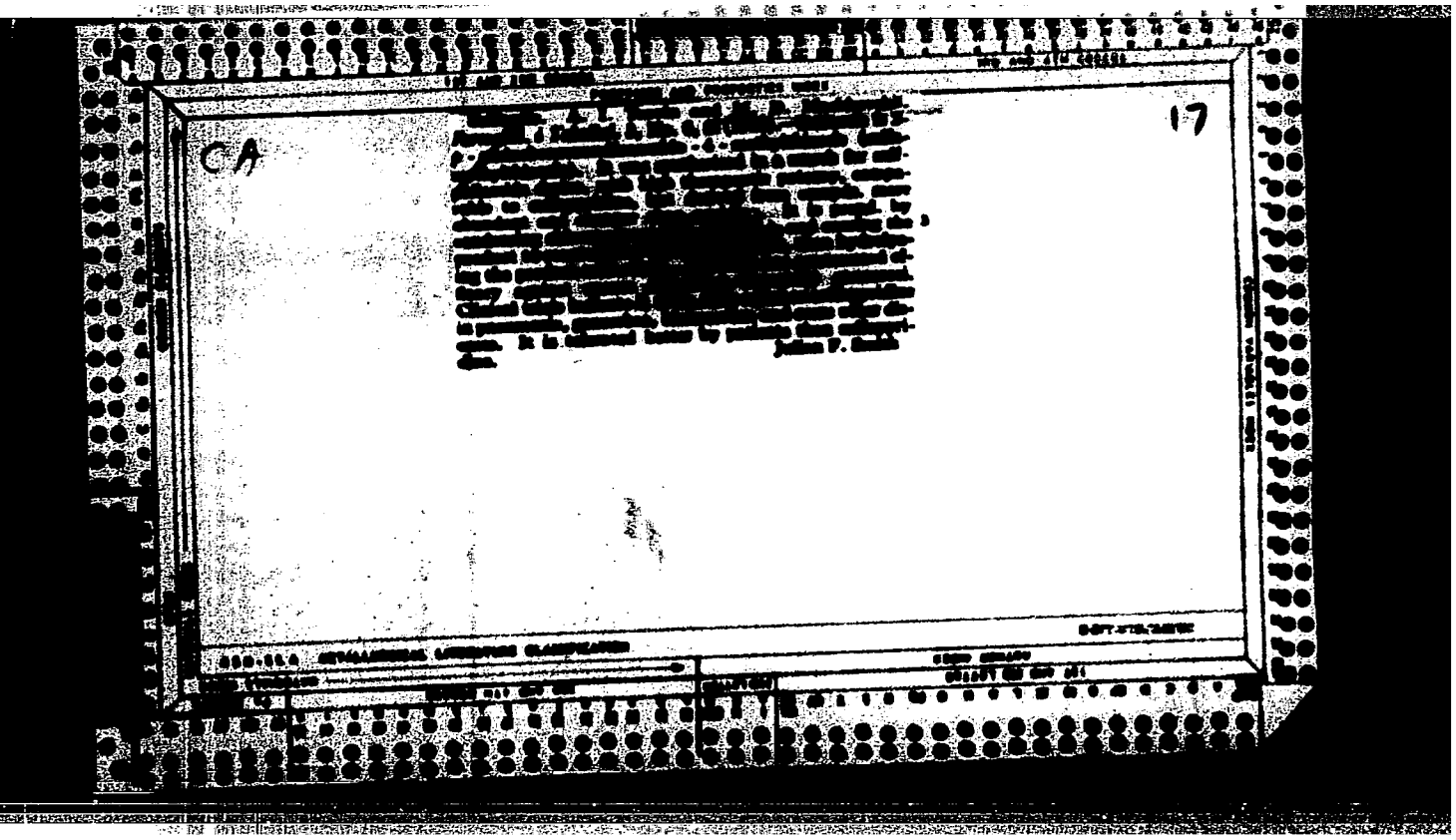
[Introduction to analysis. Differential calculus] Vvedenie v analiz. Differentsial'noe ischislenie. Minsk, Vysshaia shkola, 1964. 234 p. (MIRA 18:3)

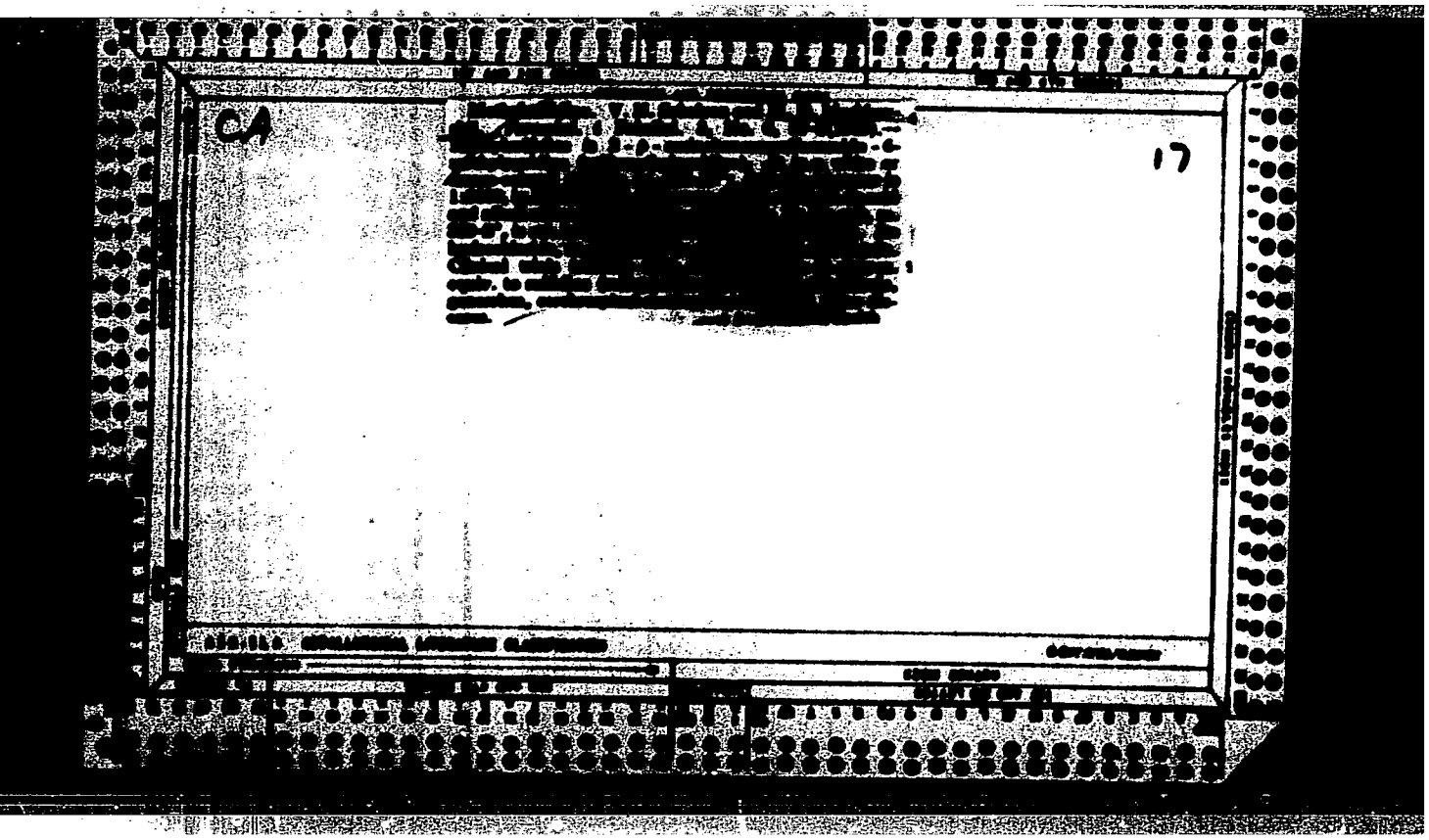
MASHKOVSKIY, A.V.

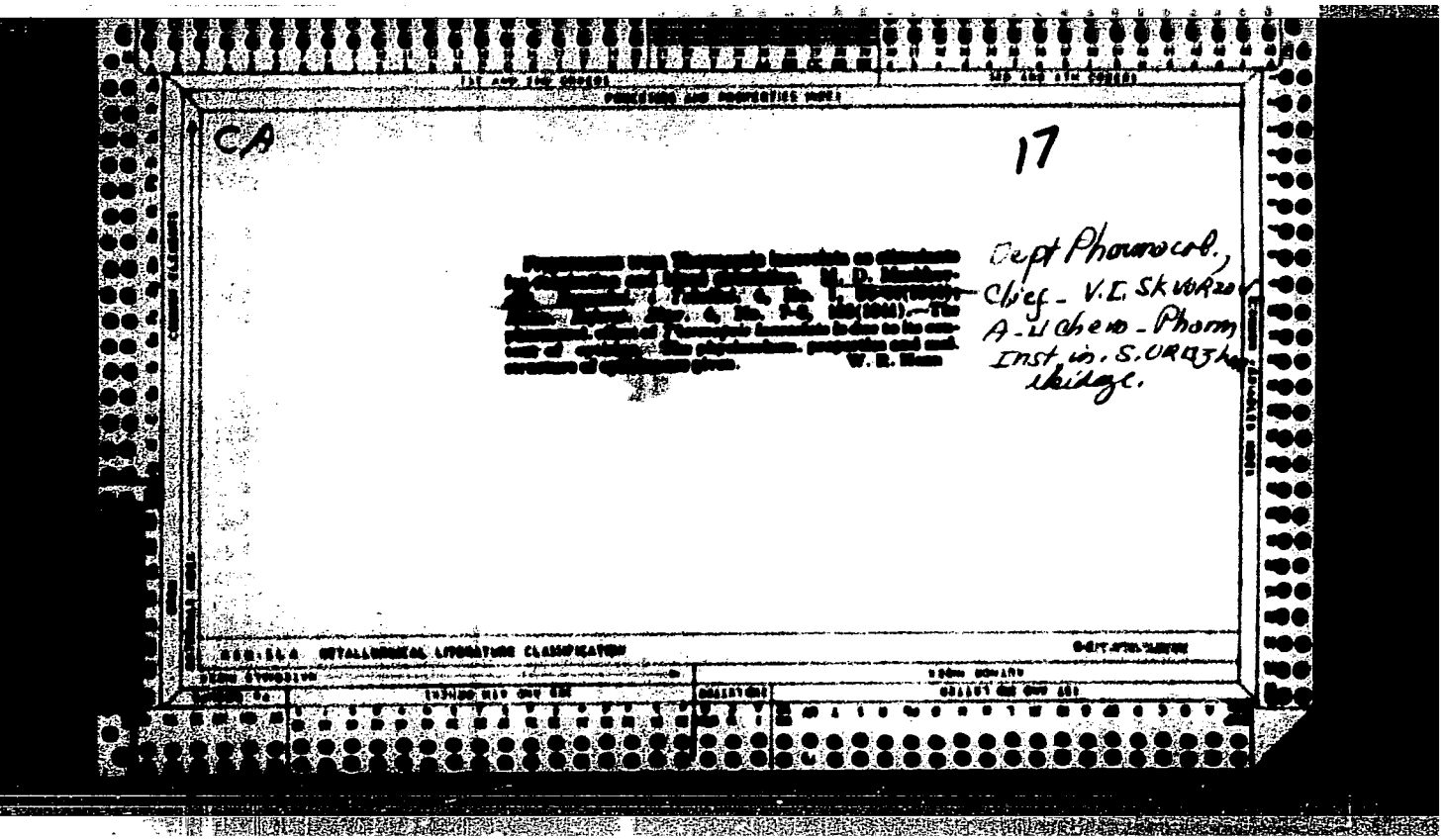
Economic activity of the Middle Volga Economic Council. Biul.tekh.-ekon.inform.Gos.nauch.-issl.inst.nauch.i tekh.inform. 18 no.9:45-47 S '65. (MIRA 18:10)

MASHKOVSKIY, M., bukhgalter-instruktor (Zaporozh'ye).

Simplifying accounting for transportation expenditures reinbursed by the purchaser. Bukhg.uchet 15 no.9:22-24 S '56. (MLRA 9:11)
(Transportation--Accounting)

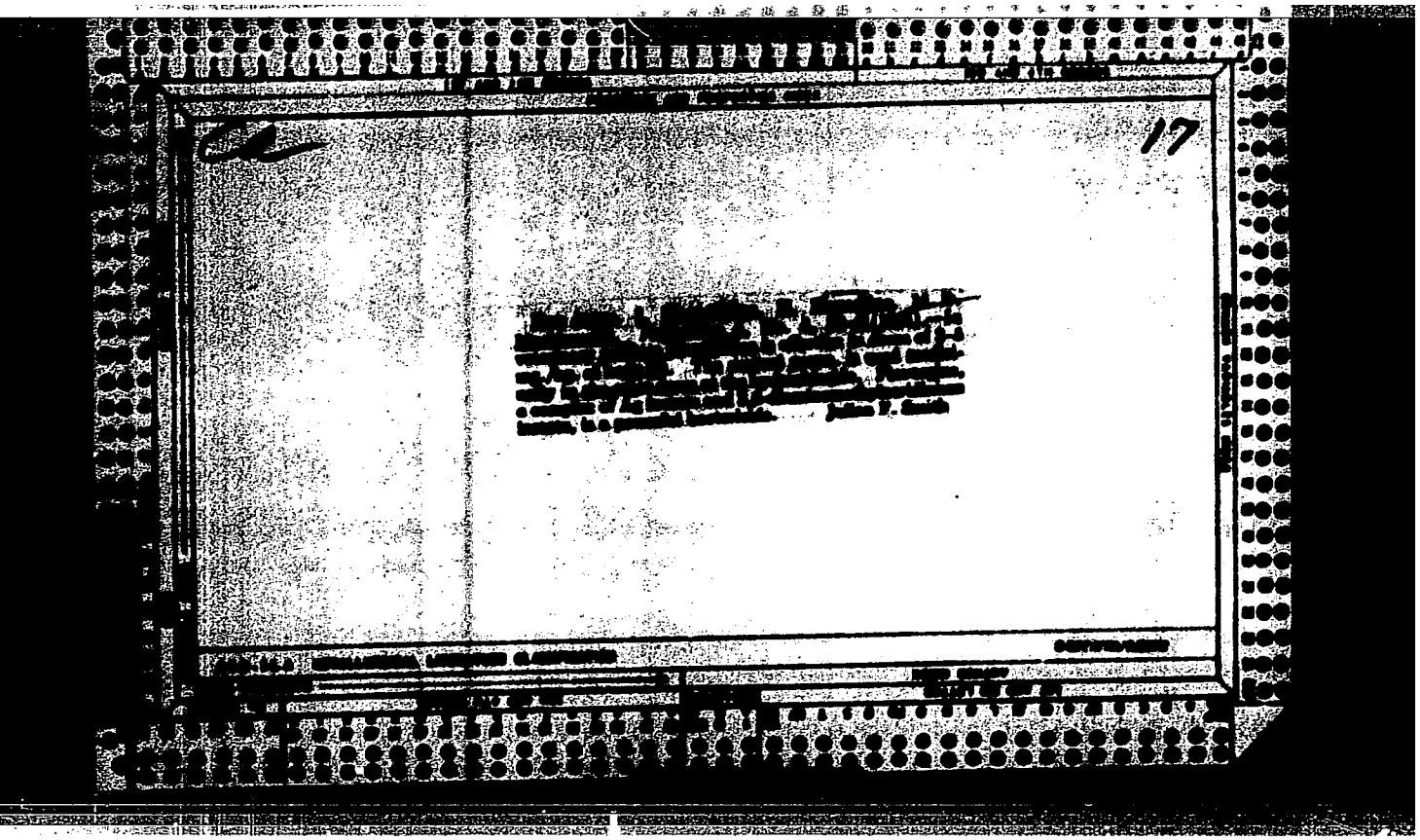






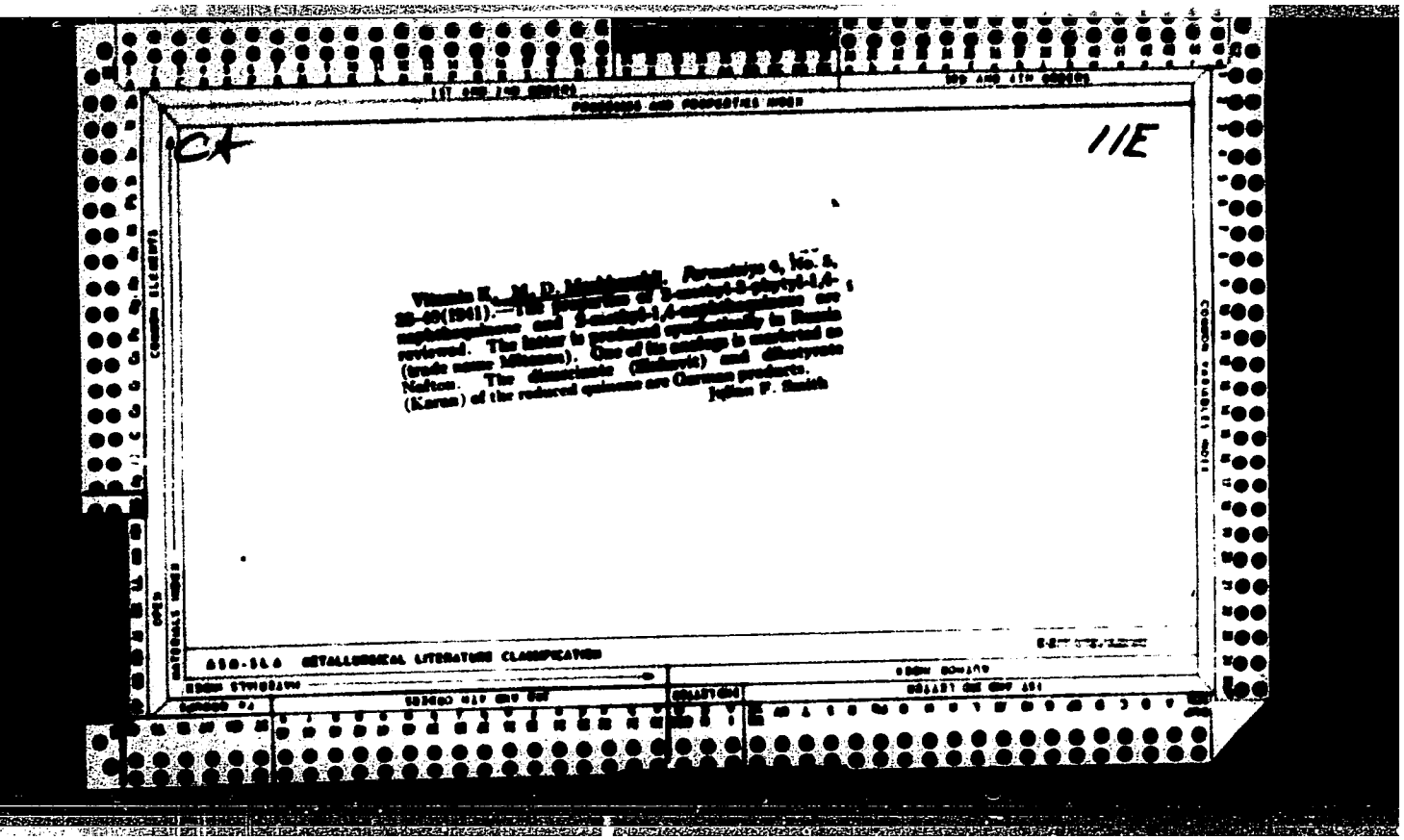
MASHKOVSKIY, M. D.

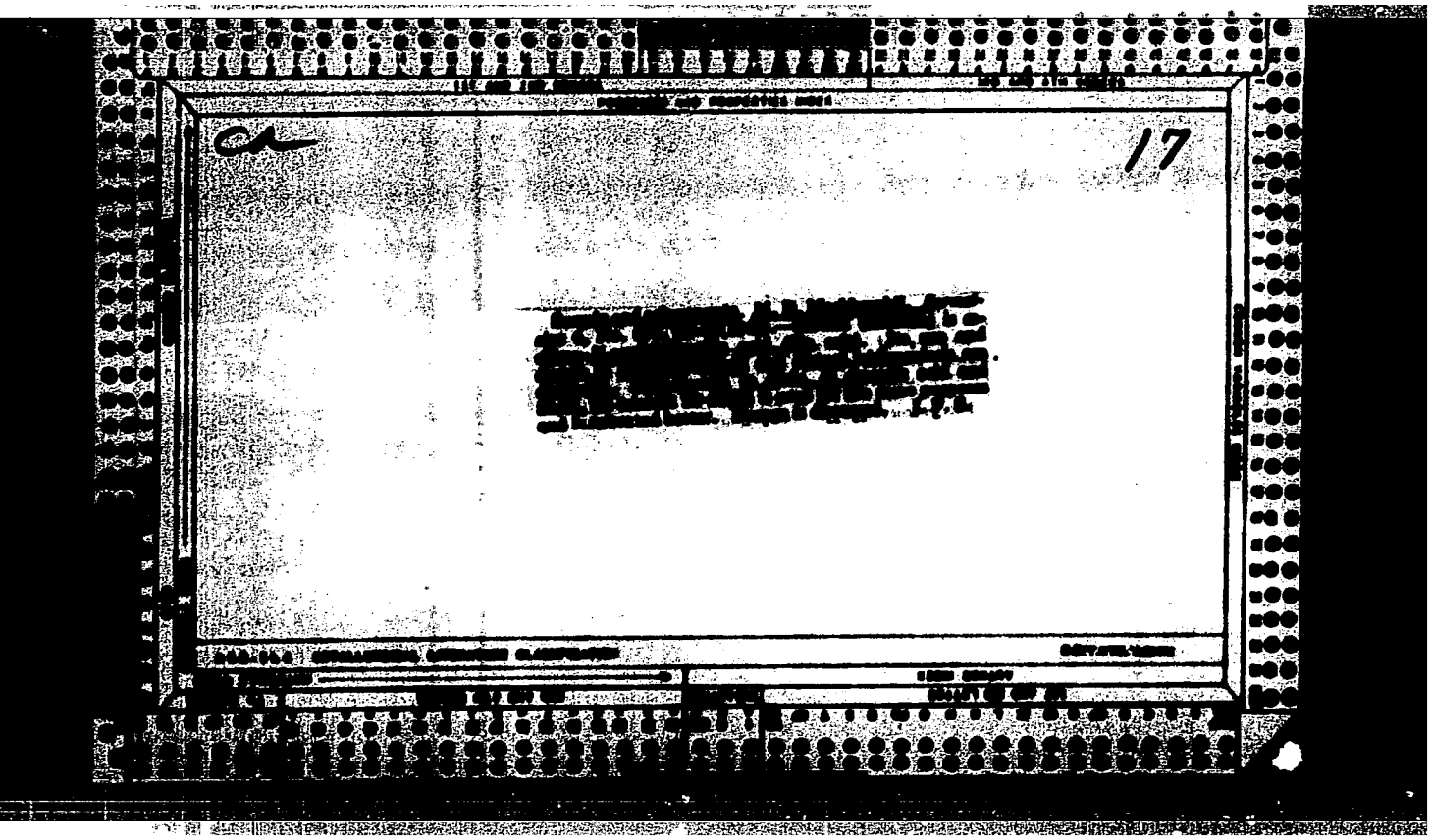
"Trachelantin and Trachelantamin - New Alkaloids Inhibiting the Parasympathetic Nervous System," Farmakol. i Toksikol., 4, No.2, 1941

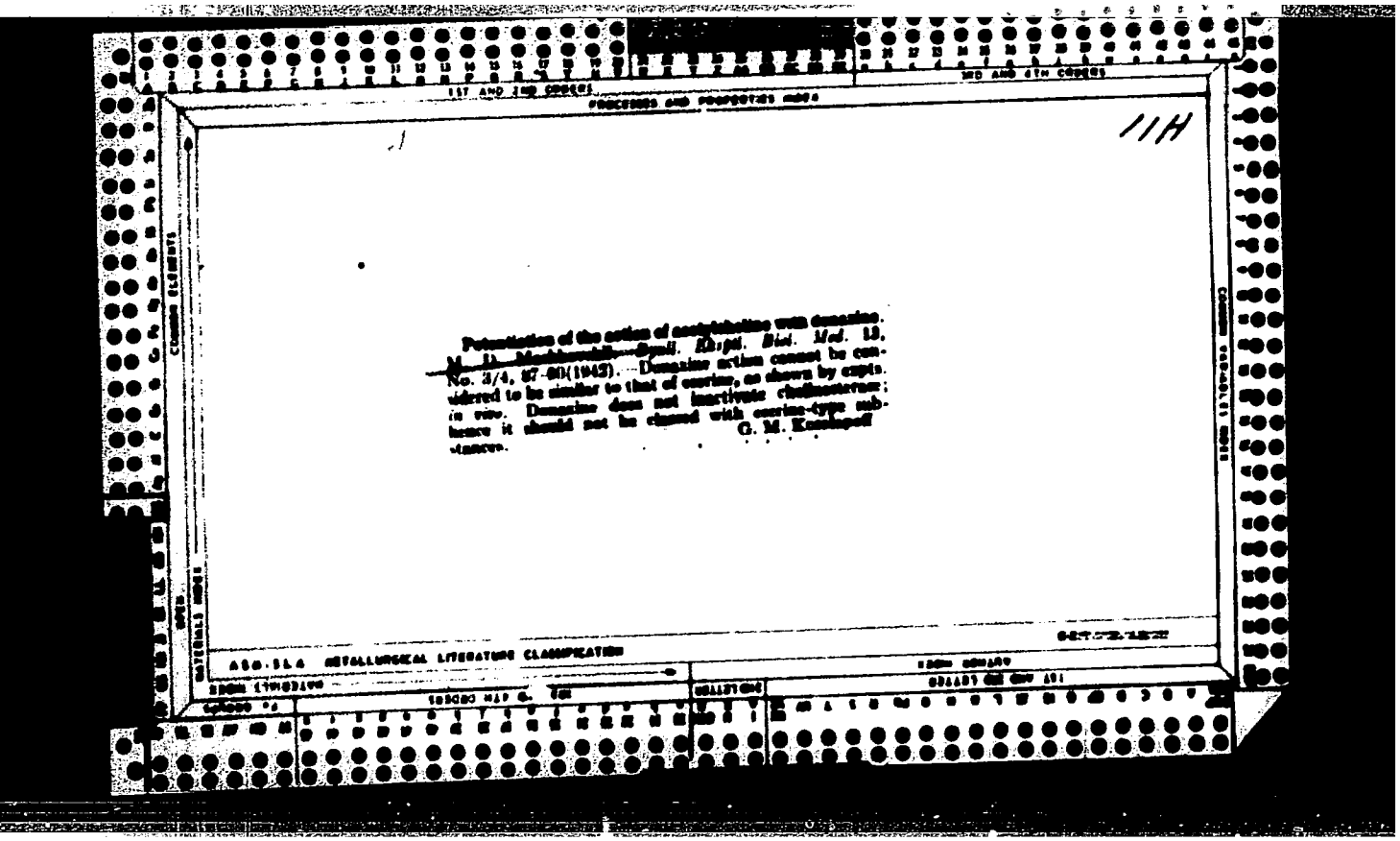


MASHKOVSKIY, M. D.

"A Contribution to the Pharmacology of Spiramin," Farmakol. i Toksikol., 4, No.4-5, 1941







1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

Pharmacology of the alkaloid, thaline. M. D. Mash-kovskii. *Farmakol. i Toksikol.* 6, No. 1, [illegible](1943); [illegible] Med. 2, [illegible](1944).—Thaline was iso-lated from Thalictrum [illegible] and studied as the sul-fate, white, cryst., readily sol. in water. Thaline in low doses had no effect on isolated intestine and uterus. High concn. depressed activity of the intestine; uter-ine tonus remained unchanged. It caused a lowering of blood pressure, which was independent of central and peripheral nervous systems; the heart was not involved. The hypotension was due mainly to loss of muscle tonus with subsequent blood stasis here, but a contributory factor was respiratory [illegible], interfering with the return of blood to the heart. In this respect thaline superficially resembles curare; it depresses the motor centers of the brain, causing a general loss of tonus of skeletal muscle system. Thaline is extremely toxic; the initial oral dosage should be about 10-20 mg. W. R. Hess

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

MASHKOVSKIY, M. D. Cand. Med. Sci.

"Prof. I. H. Burns, M. D.," translated and edited by M. D. Mashkovskiy, Farmakol. i Toksikol., 9, No.5, 1946